Effect of Interactivity on Donation Intention: Mediated Roles of Playfulness, Social Presence, Sympathy, and Perceived Response Efficacy

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Abstract

Interactive advertising can improve consumers' purchase intentions, but its effectiveness in promoting donation behaviors is less explored. This study investigates the relationship between perceived interactivity and donation intention. Data were collected from 600 MTurk participants through a between-subject experimental design. Our findings indicate that perceived interactivity positively affects donation intention. Furthermore, this influence is mediated by perceived playfulness, sympathy, social presence, and perceived response efficacy.

Keywords: interaction design, advertising, donation, behavior

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As one of the emerging forms of advertising, interactive advertising adds features to traditional advertising that allow consumers to interact with and participate in the ads (Bezjian-Avery, Calder, & Iacobucci, 1998). These interactive features provide active control, two-way communication, and a sense of synchronous reaction for the audience during interaction (Liu & Shrum, 2002; Lombard & Snyder-Duch, 2001; McMillan & Hwang, 2002). Traditional advertising, such as static image ads in shopping malls, provided a one-way channel for delivering marketing information to the audience in a controlled, linear narrative. Compared to traditional advertising, interactive advertising has been shown to increase both consumers' attitudes and purchase intentions (Macias, 2003) and further improve overall marketing performance (Gu et al., 2022). An example of interactive advertising was the 2015 augmented-reality-based ad launched by Coca-Cola in the United States, titled "Next time you're thirsty, drink an ad" (Dipdrop Branding Solution, 2015). During basketball games, viewers could enjoy a visual experience of a smooth transition from TV to mobile devices, as they watched Coke Zero being poured from a bottle on the TV screen into a glass in the mobile app. Coca-Cola then offered a coupon code redeemable for a bottle of Coke Zero (The Coca-Cola Company, 2015).

While previous research on interactive advertising has focused on its effects on consumption behaviors (e.g., Ahn, Ellie Jin, & Seo, 2024), the impact of interactive advertising on donation intentions and behaviors has been minimally explored. In this study, we aim to understand how interactive advertisements influence donation attitudes and behaviors. Therefore, our research question is: how does the level of advertising interactivity impact the audience's donation intentions?

The Present Study

Research has shown that interactive design features of advertisements (e.g., buttons and body gestures) contribute to higher purchase intention (Ahn et al., 2024; Gu et al., 2022). At the same time, the perceived interactivity of visual materials can positively influence the audience's emotions, such as perceived playfulness, levels of sympathy, and social presence (Hand & Varan, 2009; Ide et al., 2021; Kang, Shin, & Ponto, 2020). Furthermore, the audience's positive emotions, including perceived playfulness, sympathy, and social presence, were examined separately and shown to affect perceptions of efficacy and behavioral intentions (Chen, Dai, Yao, & Li, 2019; Kim & Yu, 2015). Additionally, researchers identified perceived response efficacy, the belief that consumers' help can make a meaningful difference for beneficiaries (Septianto & Paramita, 2021; Sharma & Morwitz, 2016), as an important factor in explaining donation behaviors.

Building on the prior research, we propose the following five hypotheses (H1–H5):

- H1. Perceived interactivity of advertisements will be positively related to (a) perceived playfulness, (b) level of sympathy, and (c) social presence.
- H2. Perceived playfulness will be positively related to (a) perceived response efficacy and (b) donation intention.
- H3. Level of sympathy will be positively related to (a) perceived response efficacy and (b) donation intention.
- H4. Social presence will be positively related to (a) perceived response efficacy and (b) donation intention.
- H5. Perceived efficacy will be positively related to donation intention.

Method

We conducted a between-subjects online experiment with two groups: high-interactivity and low-interactivity (controlled group). The stimulus is designed as an

ad that encourages participants to donate winter clothing to a local homeless girl. For interactive features, participants in two groups either used a drag-and-drop feature to "donate" three pieces of clothing (i.e., high-interactivity) or watched an animation of the giving process for those three pieces of clothing (i.e., low-interactivity).

The current study was **NOT** preregistered. Simulated data and codes are available at OSF and GitHub.

Participants and Procedure

The total sample in the current study consists of 600 US adults recruited from Amazon MTurk ($M_{\text{age}} = 38.85$, $SD_{\text{age}} = 8.01$). They were evenly assigned to one of the two conditions. The experiment begins with a consent process, followed by participants interacting with the stimuli, and then an online questionnaire including measures of variables and demographic questions. The questionnaire also includes measures of graphic qualities to ensure differences in these qualities between the two groups are not significant, and three focus questions to ensure participants answer the questions with their focus.

The eligibility criteria of participants include being adults, living in the US, being comfortable speaking English, and having access to a laptop and the Internet to complete the tasks and survey using a web browser. Each participant is compensated with a $25 Amazon gift card.

Here is a table of the detailed breakdown of participants' demographic information:

Table 1

Demographic Breakdowns of Participants

Item	Category	Frequency	Percentage
Gender	Female	191	31.83%
	Male	163	27.17%

Table 1 continued

Item	Category	Frequency	Percentage
	Non-binary or third gender	187	31.17%
Race	White	90	15%
	Black or African American	93	15.5%
	American Indian or Alaska Native	103	17.17%
	Asian	109	18.17%
	Native Hawaiian or Pacific Islander	88	14.67%
Income	Less than $10,000	40	6.67%
	$10,000 - $19,999	56	9.33%
	$20,000 - $29,999	44	7.33%
	$30,000 - $39,999	50	8.33%
	$40,000 - $49,999	47	7.83%
	$50,000 - $59,999	42	7%
	$60,000 - $69,999	44	7.33%
	$70,000 - $79,999	56	9.33%
	$80,000 - $89,999	52	8.67%
	$90,000 - $99,999	51	8.5%
	$100,000 - $149,999	51	8.5%
	More than $150,000	43	7.17%
Education	Less than high school	80	13.33%
	High school graduate	84	14%
	2 year degree	88	14.67%
	4 year degree	84	14%
	Professional degree	66	11%
	Doctorate	83	13.83%

Measures

Perceived Graphics Quality. As a manipulation check, participants completed a three-item, 7-point Likert scale (Kang et al., 2020), which assessed their perceived graphics quality (Cronbach's alpha = -0.02).

Perceived Interactivity. Participants completed a five-item, 7-point Likert scale (Wu, 2005; Yim, Chu, & Sauer, 2017), which assessed their perceived interactivity (Cronbach's alpha = 0.85).

Social Presence. Participants completed a ten-item, 7-point Likert scale (Higgins, Zibrek, Cabral, Egan, & McDonnell, 2022), which assessed their social presence (Cronbach's alpha = 0.84).

Sympathy. Participants completed a 10-item, 7-point Likert scale (Baberini, Coleman, Slovic, & Västfjäll, 2015), which assessed their sympathy (Cronbach's alpha = 0.91).

Perceived Playfulness. Participants completed a four-item, 7-point Likert scale (Kang et al., 2020), which assessed their perceived playfulness (Cronbach's alpha = 0.81).

Perceived Response Efficacy. Participants completed a four-item, 7-point Likert scale (Cryder, Loewenstein, & Scheines, 2013; Sharma & Morwitz, 2016), which assessed their perceived response efficacy (Cronbach's alpha = 0.81).

Donation Intention. Participants completed a three-item, 7-point Likert scale (Li & Yin, 2022), which assessed their donation intention (Cronbach's alpha = 0.81).

Data analysis

We used R (Version 4.5.1; R Core Team, 2024) and the R-packages *apaTables* (Stanley, 2021), *base* (Version 4.5.1; R Core Team, 2024), *devtools* (Version 2.4.6;

Wickham, Hester, Chang, & Bryan, 2025), *dplyr* (Version 1.1.4; Wickham, François, Henry, Müller, & Vaughan, 2023, 2023), *faux* (Version 1.2.3; DeBruine, 2025, 2025), *ggplot2* (Version 4.0.0; Wickham, 2016, 2016), *groundhog* (Version 3.2.3; Simonsohn & Gruson, 2025, 2025), *knitr* (Version 1.50; Xie, 2015), *labelled* (Version 2.16.0; Larmarange, 2025, 2025), *missMethods* (Version 0.4.0; Rockel, 2022, 2022), *papaja* (Version 0.1.4; Aust & Barth, 2025, 2025), *psych* (Version 2.5.6; William Revelle, 2025, 2025), *summarytools* (Version 1.1.4; Comtois, 2025, 2025), *tinylabels* (Version 0.2.5; Barth, 2025, 2025), and *usethis* (Version 3.2.1; Wickham, Bryan, Barrett, & Teucher, 2025) for all our analyses.

Results

Manipulation Tests

Overall, the graphic quality of the stimuli for two participant groups is well perceived ($M_{\text{graphic quality}} = 5.68$, $SD_{\text{graphic quality}} = 0.89$). The results from a Welch's independent samples t-test indicated no significant differences between the two groups, $t(597.16) =$ -1.43, $p = 0.153$ (see Figure 1).

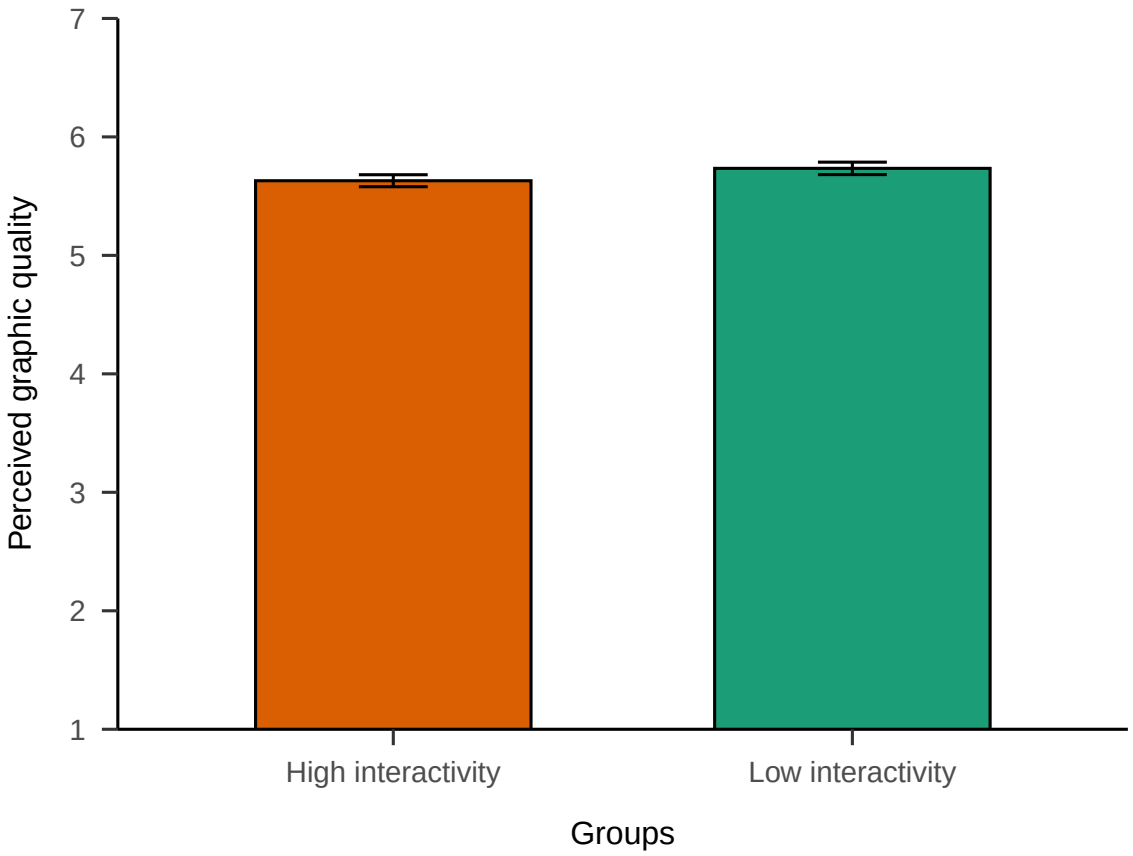

Figure 1. Perceived graphic quality of stimuli.

According to the results from a Welch's independent samples t-test that compares the perceived interactivity of the stimuli between the high-interactivity group ($M_{\text{high interactivity}} = 5.66$, $SD_{\text{high interactivity}} = 0.71$) and the low-interactivity group ($M_{\text{low interactivity}} = 2.36$, $SD_{\text{low interactivity}} = 0.78$), there are significant differences between the two groups, $t(592.02) = 54.40$, $p < .001$ (see Figure 2).

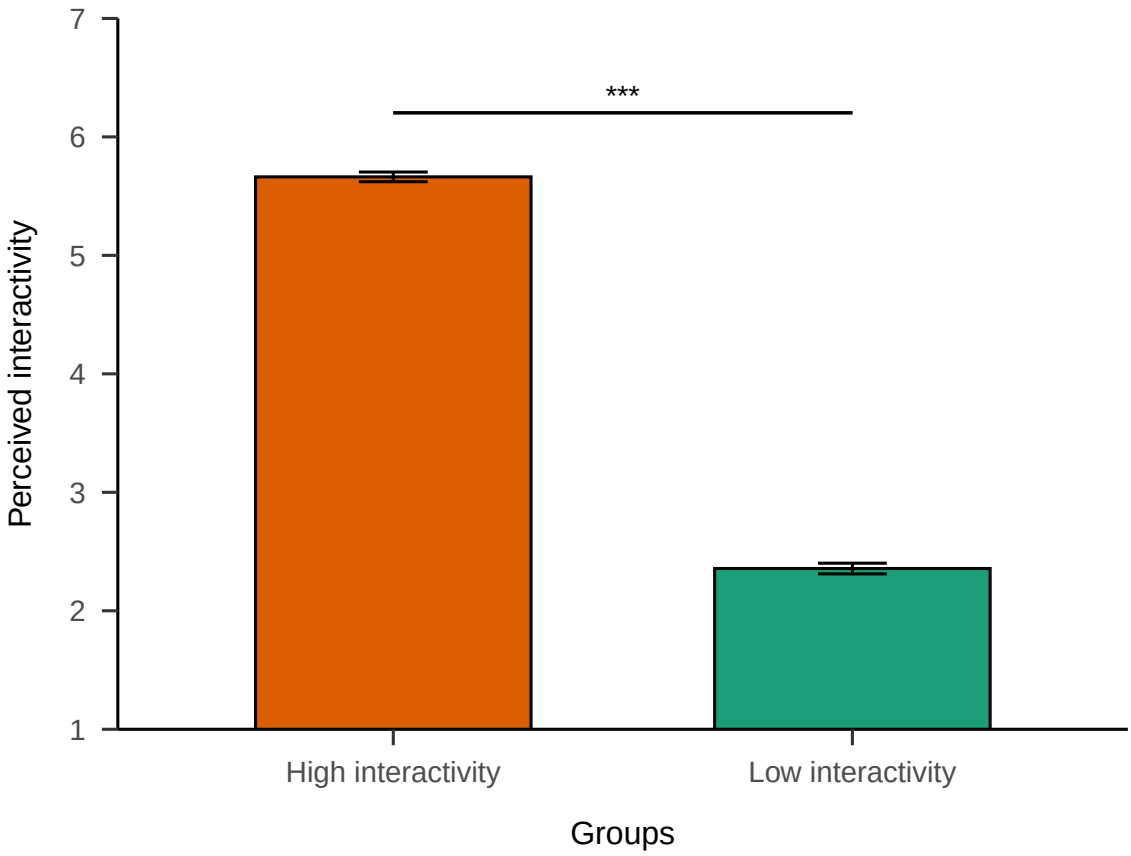

Figure 2. Perceived interactivity of stimuli.

Hypotheses Validation

A series of Pearson correlation tests was conducted to assess the hypotheses. All hypotheses were supported (see the table below).

Table 2

Hypotheses Test Results

Hypothesis	Pairs	t	p
H1a	Interactivity-Playfulness	34.35	$< .001$
H1b	Interactivity-Sympathy	43.98	$< .001$
H1c	Interactivity-Social presence	37.32	$< .001$

Table 2 continued

Hypothesis	Pairs	t	p
H2a	Playfulness-Response efficacy	33.10	$< .001$
H2b	Playfulness-Donation intention	32.43	$< .001$
H3a	Sympathy-Response efficacy	40.76	$< .001$
H3b	Sympathy-Donation intention	40.80	$< .001$
H4a	Social presence-Response efficacy	34.20	$< .001$
H4b	Social presence-Donation intention	35.40	$< .001$
H5	Response efficacy-Donation intention	34.12	$< .001$

Discussion

This study aimed to explore how perceived interactivity influences donation intention in advertisement design. The results supported our hypotheses, showing that this relationship is mediated by perceived playfulness, sympathy, social presence, and response efficacy. As a result, these findings suggest that advertisers and marketers should focus on interactive features to effectively encourage donation intentions. Future research should explore which design elements can effectively improve perceived interactivity.

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