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The negative effect of advertisement signs on consumers' willingness to purchase

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Advertisements (ads) are intended to increase individuals' willingness to purchase and are usually expensive; thus, it would be counterproductive if an ad element actually decreased willingness to purchase. Online shopping platforms often present commodities with an advertising sign (e.g., "ad") in the corner of their display pictures. Does this advertising sign itself increase or decrease consumers' willingness to purchase? To address this question, we conducted seven studies. Studies 1 to 5 showed that participants had less willingness to purchase, recommend, or click on products with (vs. without) ad signs. Studies 6 and 7 revealed that participants felt the quality of products with and without ad signs was the same but they showed an implicit aversion to ads, suggesting that this unwillingness to purchase was rooted not in their explicit evaluation of the products but in their implicit disgust at ads. Practical and theoretical implications are discussed.

Keywords
consumer decision making, advertising, purchase intention, willingness to purchase, product evaluation

Article Highlights

- We conducted several studies in which participants viewed the same products in one of two conditions: with or without advertising signs.
- Willingness to purchase, recommend, and click on products was lower in the advertising-sign condition compared to the condition with no advertising sign.
- Lower willingness to purchase was not due to explicit feelings about the quality of the products with advertising signs but, rather, resulted from an implicit aversion to advertisements.

We investigated the effect of advertisement (ad) signs on consumers' willingness to purchase. The preview pictures of online ads often have a sign (e.g., "ad") in one corner. Do these ad signs encourage or impede consumers' willingness to purchase? The existing literature on how ads affect consumers' behavior comprises four prominent aspects.

The first aspect is the role of advertising format (e.g., print, television, online, social media) in the effectiveness of ads. Studies have shown that the effectiveness of advertising varies depending on the product or service being promoted, the target audience, and the context of exposure (Burns & Lutz, 2006; Fogel & Prabhu, 2022; Jaeger & MacFie, 2001; Suárez-Álvarez & Pastor-Rodríguez, 2023; Yagci et al., 2009). The second aspect is the role of emotional appeals in the

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ad's effectiveness. Ads that evoke emotions tend to be more persuasive in influencing willingness to purchase. Emotional appeals, such as humor, fear, nostalgia, or empathy, can create a strong connection with consumers and enhance their attitude toward the product or brand (Escalas & Stern, 2003; Holbrook & Batra, 1987; Jones & Hamby, 2023; Nagano et al., 2023; Poels & Dewitte, 2006). The third aspect is the role of celebrity endorsements in the effectiveness of an ad. Celebrity endorsements can have a significant impact on consumers' purchase intention. When a well-liked or respected celebrity promotes a product, this can lead to higher willingness to purchase, as consumers may associate the celebrity's positive attributes with the endorsed product (Amos et al., 2008; Eisend & Langner, 2010; Garnepudi & Sudheer, 2022; Lee et al., 2022; Schouten et al., 2020). The fourth aspect is the role of brand awareness and familiarity in the ad's effectiveness. Consumers are more likely to buy products from brands they are familiar with and trust. Advertising plays a crucial role in building brand awareness and shaping consumers' brand perception, which, in turn, influences their willingness to purchase (Baker et al., 1986; Campbell & Keller, 2003; Clark et al., 2009; García-Madariaga et al., 2023; Zhao et al., 2022).

While researchers have examined the effect of ads on consumers' behavior from several perspectives, there have been few studies of the effect of ad signs on willingness to purchase. This research has important practical implications because these signs are common in the modern online shopping world. To fill this gap in the literature we used two identical products, one with and one without an ad sign, to examine willingness to purchase. Classical and modern utility theories, like expected utility theory (Friedman & Savage, 1948) and prospect theory (Kahneman & Tversky, 1979; Tversky & Kahneman, 1992), assert that people base their decisions solely on the utility of products. In our research, given that the product was identical in the two conditions, the focal products should have the same utility and thus induce the same willingness to purchase. In other words, we hypothesized that ad signs would have no effect on consumers' willingness to purchase. The following studies tested this hypothesis and its extension, then examined the origin of this effect.

Study 1: Preference Between Products With and Without Ad Signs

Study 1 tested the hypothesis that ad signs would have no effect on willingness to purchase, by asking participants to choose between two identical products, one with and the other without an ad sign.

Method

Participants

A power analysis (G*Power 3.1; Faul et al., 2007) suggested that 60 participants would ensure statistical power in the case of a medium effect size (one-sample t test, $\alpha = .05$, $1 - \beta = .95$, effect size = .48). The expected effect size was determined by a pilot study. Study 7, which also had a within-subjects design, adopted the same sample size.

Participants ($N = 60$) with an age range of between 19 and 25 years ($M = 21.57$, $SD = 1.50$), comprising 28 (46.7%) women and 32 (53.3%) men from Southwest University, completed the study via an online survey platform (www.wjx.cn). This study was approved by the ethics committee of psychological research at Southwest University.

Procedure

Participants answered questions concerning 10 products. For each question we presented two pictures of the same product simultaneously, and the only difference between them was whether the word "ad" appeared in the bottom right corner of the picture. The pictures were chosen from online shopping platforms. To simulate real ad signs we set the transparency of the word to 70% (see Figure 1). We balanced the order of presentation of the 10 questions and the position of the two pictures of the same product. A sample question is as follows:

> Suppose you want to buy a small storage box. You have found this storage box in two online stores, A and B. It is made by the same manufacturer; the only difference is whether it has an ad sign. From which online store do you prefer to buy this storage box at a cost of CNY 15?

Figure 1. *An Example Question Used in Study 1*
Note. CNY 15 = USD 2.00.

Results and Discussion

Participants who chose the ad product received a score of 1 point; otherwise, the score was 0 points. The sum of all questions, ranging from 0 to 10, was used for data analysis.

According to utility theory, people should perceive no difference between products with and without ad signs; therefore, the sum total should be 5 on average. To see whether this was the case, we ran a one-sample t test. Participants chose the ad product ($M \pm SD = 3.40 \pm 3.84$) less often than the theoretical midpoint value of 5, $t(59) = -3.23$, $p = .002$, Cohen's $d = -0.89$, and selected the non-ad choice ($M \pm SD = 6.60 \pm 3.84$) more often than the theoretical midpoint value.

Study 1 asked participants to make a direct choice between two products with or without an ad sign and found that they preferred the product without an ad sign. Will this effect endure in a situation in which the direct comparison disappears? To investigate this, we carried out Study 2.

Study 2: Purchase Intention for Products With Ad Signs

In Study 2, two groups of participants indicated their purchase intention for two identical products, one with and the other without an ad sign. We then compared the groups to see whether there was a difference in purchase intention.

Method

Participants

A power analysis (G*Power 3.1; Faul et al., 2007) suggested that 118 participants would ensure statistical power in the case of a medium effect size (independent samples t test, $\alpha = .05$, $1 - \beta = .80$, effect size = .52). The expected effect size was determined by a pilot study. Studies 3 to 6, which also had a between-subjects design, adopted similar sample sizes.

Participants ($N = 118$) with an age range of between 17 and 23 years ($M = 20.08$, $SD = 1.07$), comprising 104 (88.1%) women and 14 (11.9%) men from Southwest University, were seated in a laboratory and answered the questionnaire on an online survey platform (www.wjx.cn).

Procedure

Participants were quasirandomly assigned to the ad or no-ad condition. They were arranged by chronological order of participation in the study, among which the even numbers were assigned to the control group and the odd numbers were assigned to the experimental group viewing products with ad signs. The products were the same as in Study 1. Participants were told that this was a survey about consumer decision making and they indicated their purchase intention for each item on an 8-point Likert scale (1 = *definitely inclined not to buy*, 8 = *definitely inclined to buy*).

Results and Discussion

For each participant we averaged the purchase intention scores across the 10 questions to obtain the averaged purchase intention (API) score. We then used independent samples t tests to compare APIs between the groups. Relative to the API of the group viewing the product with no ad sign ($M \pm SD = 4.67 \pm 0.81$), the API of the ad group ($M \pm SD = 4.09 \pm 0.89$) was significantly smaller, $t(116) = -3.72$, $p < .001$, Cohen's $d = -0.68$. In other words, participants were more reluctant to buy the products with ad signs.

Study 3: Predicting Others' Purchase Intention

Study 3 investigated whether participants thought others would be indifferent when choosing between two identical products, one with and one without an ad sign. According to self-projection theory (see, e.g., Buckner & Carroll, 2007; Irish et al., 2012; Waytz & Mitchell, 2011), which essentially states that people are inclined to project their own thoughts and emotions onto others, given that people prefer products without ad signs, we anticipated that they would expect others to do the same.

Method

Participants and Design

Participants ($N = 118$) with an age range of between 18 and 27 years ($M = 21.28$, $SD = 1.68$), comprising 46 (39.0%) women and 72 (61.0%) men, were recruited online. They answered the questionnaire on an online survey platform (www.wjx.cn).

The structure of this study was similar to that of Study 2, with the same between-subjects design and dependent measures, but with a third perspective to predict whether the participants thought others would like to buy the products. Participants rated others' purchase intention on an 8-point Likert scale (1 = *definitely inclined not to buy*, 8 = *definitely inclined to buy*).

Results and Discussion

For each participant we averaged the speculated purchase intention scores across the 10 questions to obtain the API. We then used independent samples t tests to compare APIs between the groups. Relative to API of the group that did not see

the ad sign ($M \pm SD = 5.46 \pm 1.06$), the API of the ad group ($M \pm SD = 5.00 \pm 1.21$) was significantly smaller, $t(116) = -2.19$, $p = .03$, Cohen's $d = -0.40$. That is, participants thought others would also be more reluctant to buy products with (vs. without) ad signs. This finding is consistent with self-projection theory (Buckner & Carroll, 2007; Irish et al., 2012; Waytz & Mitchell, 2011).

Study 4: Recommendation Intention for Products With Ad Signs

Study 4 investigated whether people would be equally willing to suggest that others buy a product with or without an ad sign. This point is relevant because consumers' purchasing behavior is often influenced by suggestions from family members, friends, or even strangers. If ad signs decrease people's willingness to suggest that others buy a product, this can be regarded as another negative effect.

Method

Participants and Design

Participants ($N = 118$) with an age range of between 17 and 28 years ($M = 20.68$, $SD = 1.67$), comprising 62 (52.5%) women and 56 (47.5%) men, were recruited from Southwest University. They answered the questionnaire on an online survey platform (www.wjx.cn).

Participants were randomly assigned to the ad condition or the no-ad condition. The structure of this study was identical to that of Study 3. After viewing each picture, participants were asked whether they were willing to suggest that others buy the product. Responses were rated on an 8-point Likert scale (1 = *definitely suggest not to buy*, 8 = *definitely suggest to buy*).

Results and Discussion

For each participant we averaged the suggestion intention scores across the 10 questions to obtain the averaged suggestion intention (ASI). We then used independent samples *t* tests to compare ASIs between the groups. Relative to the ASI of the group that did not see the ad sign ($M \pm SD = 5.22 \pm 0.93$), the ASI of the ad group ($M \pm SD = 4.65 \pm 1.23$) was significantly smaller, $t(116) = -2.84$, $p = .005$, Cohen's $d = -0.52$. In other words, participants were less inclined to suggest that others buy products with ad signs.

Study 5: Intention to Click on Products With Ad Signs

Study 5 investigated whether people would be equally willing to click on a product picture with or without an ad sign. In addition to willingness to purchase and willingness to suggest, as assessed in Studies 1 to 4, Study 5 used willingness to click to measure the impact of ad signs, as a further check of the robustness of the negative effect of ad signs.

Method

Participants

We tried to recruit as many participants as in Studies 2–4. Nevertheless, due to COVID-19 pandemic controls, our sample size was slightly smaller. Participants ($N = 90$) with an age range of between 18 and 23 years ($M = 20.59$, $SD = 1.51$), comprising 71 (78.9%) women and 19 (21.1%) men from Southwest University, answered the questionnaire on an online survey platform (www.wjx.cn) while seated in a laboratory.

Procedure

The participants were assigned to groups according to their chronological order of participation in the study, among which the even numbers were assigned to the experimental group and the odd numbers were assigned to the control

group. After viewing each of 10 pictures they were asked whether they were willing to click on the picture to learn more about the products. A sample question read as follows:

Suppose that you want to buy a small storage box. How willing are you to click on the picture of this storage box worth CNY 15 [recommended by ad] to access the product details?

The only difference in the materials for the control and experimental groups was that the text for the experimental group mentioned the "[recommended by ad]" section, and the pictures for this group contained an ad sign in the bottom right corner. Participants were asked to indicate their intention to click using an 8-point Likert scale (1 = *definitely inclined not to click*, 8 = *definitely inclined to click*).

Results and Discussion

For each participant we averaged the click intention scores across the 10 questions to obtain the averaged click intention (ACI). We then used independent samples *t* tests to compare ACIs between the groups. Relative to the ACI of the group that did not see the ad sign ($M \pm SD = 5.09 \pm 0.72$), the ACI of the ad group ($M \pm SD = 4.59 \pm 0.86$) was significantly smaller, $t(88) = -2.96$, $p = .004$, Cohen's $d = -0.63$.

In other words, participants were more reluctant to click on the product pictures with ad signs. One possible explanation for this finding is that the participants felt that the products with ad signs were lower quality than those without ad signs. (The same products were presented to the groups. Objectively, these products should be of equal quality. Nevertheless, participants might subjectively think those with ad signs were of poorer quality.) To examine this possibility, we conducted Study 6.

Study 6: Perceived Quality or Experience of Products With Ad Signs

Study 6 investigated whether people explicitly believe that the quality or experience of products with ad signs is worse than that of products without ad signs.

Method

Participants

Participants ($N = 118$) with an age range of between 18 and 25 years ($M = 20.86$, $SD = 1.46$), comprising 64 (54.2%) women and 54 (45.8%) men from Southwest University, completed the questionnaire on an online survey platform (www.wjx.cn) in Study 6a. Study 6a had nonsignificant results, which we believed may be because the participants did not carefully read and answer the questions while in their own environment; thus, we repeated the study in a laboratory. Due to COVID-19 pandemic controls at that time, we could not recruit as many participants to come to the laboratory for Study 6b. Participants ($N = 84$) with an age range of between 18 and 23 years ($M = 20.62$, $SD = 1.31$), comprising 66 (78.6%) women and 18 (21.4%) men from Southwest University, were seated in a laboratory and answered the questionnaire on an online survey platform (www.wjx.cn).

Procedure

Participants were assigned to either the ad or no-ad condition. The structure of this study was similar to that of Study 2, with the same between-subjects design, but with a different dependent variable (participants' view on the products' quality or experience). A sample question read as follows:

Suppose you want to buy a small storage box. You saw a CNY 15 storage box [recommended by ad] on the internet; what do you think the quality or experience of this storage box would be like?

Responses were made on an 8-point Likert scale (1 = *very bad,* 8 = *very good*).

Results and Discussion

For each participant in Study 6a we averaged the perceived quality scores for the 10 products to obtain the averaged perceived quality (APQ). We then used independent samples t tests to compare APQs between the groups. The difference between the APQ of the group that did not see the ad sign ($M \pm SD = 5.42 \pm 0.90$) and the APQ of the ad group ($M \pm SD = 5.31 \pm 0.83$) was not significant, $t(116) = 0.70$, $p = .49$.

For Study 6b we conducted similar statistical analyses. The difference between the APQ of the group that did not see the ad sign ($M \pm SD = 5.46 \pm 0.70$) and the APQ of the ad group ($M \pm SD = 5.27 \pm 0.84$) was not significant, $t(82) = 1.17$, $p = .24$. In other words, participants did not reject products with ad signs because they explicitly thought the products were of inferior quality or experience. An alternative explanation is that our participants felt an implicit aversion to ads. People's implicit attitudes are often different from their explicit attitudes, as revealed in numerous studies (see, e.g., Fazio & Olson, 2003; Greenwald et al., 2009; Nosek et al., 2007). If people's implicit attitude toward ads is negative, then it is unsurprising that they would reject products with ad signs, as revealed in Studies 1 to 5. To examine this possibility, we conducted Study 7 with an implicit association test.

Study 7: Go/No-Go Test for Ad Sign Associations

Study 7 investigated participants' implicit attitude toward ads; specifically, whether participants are more likely to implicitly associate the word "ad" with negative terms when completing a go/no-go paradigm test (Nosek & Banaji, 2001).

Method

Participants

Participants ($N = 60$) with an age range of between 18 and 23 years ($M = 20.32$, $SD = 1.32$), comprising 46 (76.7%) women and 14 (23.3%) men recruited from Southwest University, completed the study in a laboratory.

Procedure

We used the go/no-go implicit association test paradigm. Participants were instructed to press a key for a pair of words (in go trials) or not to press a key for the pair of words (in no-go trials). People generally respond more quickly in go trials when the pair of words has implicit associations than when the words do not have such an association (Sun, 2006).

This study comprised two stages, each having two tasks. In Stage 1 participants judged the valence (positive or negative connotation) of single words. Half of the participants pressed the "j" key for positive words and did not respond to negative words in Task 1; Task 2 had the opposite arrangement. The other half of the participants had the counterbalanced arrangement. Task 1 contained 10 positive and 10 negative words, each occurring once. Task 2 had the same set of words and the same occurrence. Trials needing (not needing) a response are called go (no-go) trials. The order of trials was randomized for each task.

At Stage 2 participants judged the valence of each target word paired with the ad sign. This stage, containing Tasks 3 and 4, had the same counterbalanced and randomized arrangement as Stage 1. Tasks 3 and 4 each contained the same set of target words as Task 1, but each word was repeated twice. Sample go/no-go task trials are shown in Figure 2.

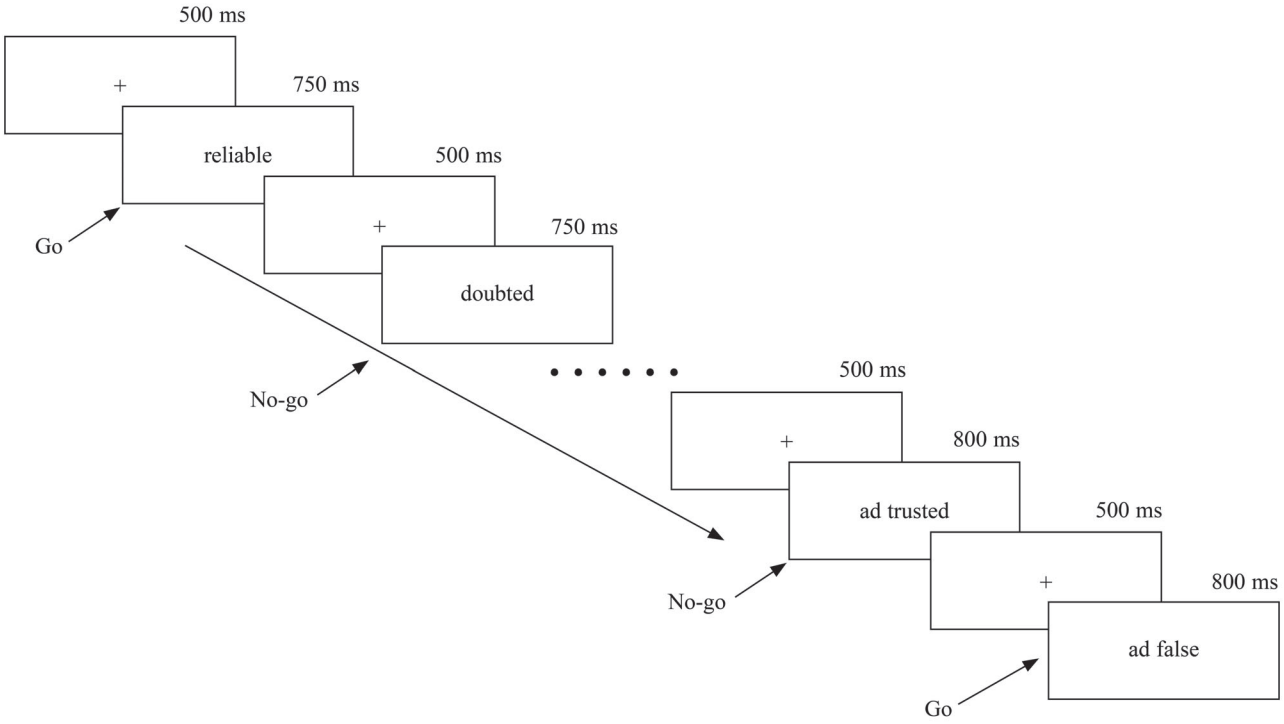

Figure 2. *Sample Go/No-Go Task Trials*

To assess the potential implicit association between ad signs and word valence, we focused on the data from Stage 2. The independent variable was the word valence: positive or negative. The dependent variable was the discrimination rate, which equaled the correct hit rate (the rate of key-pressing among go trials) minus the false alarm rate (the rate of key-pressing among no-go trials).

Results and Discussion

To investigate whether participants connected the ad sign with negative words more than with positive words, we ran a matched-pairs t test between the two conditions (positive vs. negative). Participants' discrimination rate was significantly better when the word "ad" appeared with negative words ($M \pm SD = 0.92 \pm 0.06$) compared to when it appeared with positive words ($M \pm SD = 0.90 \pm 0.08$), $t(59) = 2.19$, $p = .03$, Cohen's $d = 0.28$. In other words, participants had an implicit perception that ads were negative.

General Discussion

Study 1 required participants to choose between the same product with and without ad signs. Most preferred the no-ad-sign product. Study 2 asked for participants' purchase intention for each product separately, and they showed a lower purchase intention for products with ad signs. Study 3 required participants to guess others' purchase intention. Participants generally guessed that people would be more reluctant to buy products with ad signs. Study 4 required participants to indicate their intention to suggest that others buy products with or without ad signs. They were more likely to suggest that others not buy the products with ad signs. Study 5 found that people were more unwilling to click on online product pictures with ad signs. In all five studies, ad signs had a negative effect.

This finding contradicts common sense, previous findings, and utility theory. As a common sense measure, organizations spend huge amounts of money on advertising to improve sales, but our results show that an ad element (ad signs) actually decreases willingness to purchase. Previous research has found that different ad formats (Burns & Lutz, 2006; Fogel & Prabhu, 2022), emotions (Holbrook & Batra, 1987; Nagano et al., 2023), celebrity endorsement (Amos et al., 2008; Garnepudi & Sudheer, 2022), and brand awareness (Clark et al., 2009; García-Madariaga et al., 2023) in or by ads all improve willingness to purchase; however, we found that ad signs have a negative effect. Utility theory (Friedman & Savage, 1948; Tversky & Kahneman, 1992) presumes that people act according to utility; therefore, they should be indifferent to the choice between identical products with and without ad signs. Our findings do not support this assumption.

How can we explain this negative effect? There are two perspectives: First, although consumers do not think products with ad signs are of lower quality than those without ad signs (as revealed in Study 6a and Study 6b), they are generally implicitly averse to ads (as revealed in Study 7); thus, they are less willing to buy products with ad signs. Implicit attitudes often differ from explicit attitudes, and people's behavior is more consistent with their implicit attitude (Fazio & Olson, 2003; Greenwald et al., 2009; Nosek et al., 2007). Second, according to Hovland et al.'s (1953) attitude persuasion model (see also Bertrand et al., 2010; Huber & Arceneaux, 2007), if the intention of persuasion is disclosed in advance when seeking to influence an individual to change their attitude, this forewarning creates opportunities for the recipient to develop opposing arguments and enhances their resistance to attitude change. When consumers see products with ad signs, they may view this as an attempt at persuasion, causing spontaneous psychological resistance and lack of willingness to purchase. Which of these two theories is more plausible? Our data directly support the first option but we cannot exclude the second as a feasible way of accounting for the results of this research.

In terms of practical implications, the current research found a negative effect of ad signs on willingness to purchase, suggest, and click, which contradicts what advertisers want to achieve. Expensive ad costs further underscore this problem. In many countries, ad signs are obligatory. Therefore, how to mitigate this negative effect has important practical value and deserves further research.

There are several limitations in this research. First, the studies were based on imagined situations rather than real life. Second, we recruited only college students as participants. Third, the research did not determine which of the above two perspectives best explains the results regarding the negative effect of ad signs on willingness to purchase. Future research can explore these issues so as to deepen understanding of this phenomenon.

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The data that support the findings of this study are available on request from the corresponding author.

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