Understanding the Differential Effectiveness of Marketer versus User-generated Advertisements in Closed Social Networking Sites: An Empirical Study of WeChat

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Abstract

Purpose- In recent years, closed social networking sites (SNSs) have become popular advertising media. Marketer-generated advertisements (MGAs) and user-generated advertisements (UGAs) are the two pillars of advertising businesses. The objective of this research is to investigate and compare how these ad types (i.e., MGA versus UGA) affect advertising effectiveness in closed SNSs.

Design/methodology/approach- We conducted a scenario-based experiment of 403 WeChat users in China and used partial least squares structural equation modelling (PLS-SEM) to examine the research model.

Findings- The study results indicate that UGAs perform better than MGAs in enhancing consumers' perceived informativeness, credibility, and entertainment, while MGAs are more likely to make consumers feel irritated than UGAs in closed SNSs. Moreover, consumers' perceived informativeness, credibility, and entertainment positively influence advertising effectiveness, whereas perceived irritation negatively affects it.

Originality- This study reveals consumers' psychological response mechanisms to MGA and UGA and sheds light on their differential effectiveness by extending the stimuli-organism-response model to the context of closed SNSs.

Keywords: Marketer-generated advertisements, User-generated advertisements, Closed social networking sites, Stimuli-organism-response model

Introduction

In recent years, closed social networking sites (SNSs), such as WhatsApp and WeChat, have become the new target landscape for advertising campaigns (Kim *et al*., 2015). For instance, WeChat is the most widely used social networking app in China; it has become a popular channel for companies to launch social media advertising campaigns (Yu *et al*., 2020). In 2020, the growth of WeChat's advertising business has increased its parent company Tencent's social and other advertising revenue by 29% to 68 billion CNY (Tencent, 2020). Compared with open SNSs, closed SNSs care more about users' concerns about privacy and information redundancy (e.g., Facebook and Weibo) (Choi and Lee, 2017). Their private social networking settings (e.g., follower permissions and information access settings) shift companies' advertising attention from social networks dominated by weak ties to those consisting of strong ties (Lee and Lee, 2017). This brings companies both new opportunities and challenges to achieve advertising effectiveness in such a context.

Two types of advertisements coexist in closed SNSs. First, companies directly publish their customized ads (i.e., marketer-generated ads, MGAs) with technical and analytical support from the platform provider (Yu *et al.,* 2020). Second, individual users can create ad-like posts (i.e., user-generated ads, UGAs) on their own or in response to companies' requests (Ertimur and Gilly, 2012). An interesting phenomenon is that the difference in creators (out-group companies versus in-group individuals) in practice usually triggers potential customers' different coping mechanisms (Ertimur and Gilly, 2012). For instance, the UGA can easily resonate with consumers, and the MGA makes consumers believe in the professionalism of advertising (Thompson and Malaviya, 2013). While launching social media advertising campaigns is a frequently adopted action by companies to rapidly gain competitive advantage over their rivals in a market (Li *et al*., 2019), the associated high costs usually force companies to pay close attention to the choices of advertisements regarding their differential effectiveness. It is thus very important for companies in practice to untangle the mechanisms under which MGAs and UGAs achieve effectiveness to greatly improve the quality of their advertising decision-making.

A careful scrutiny of the literature on social media advertising suggests three research gaps. First, although previous studies have compared MGA and UGA, the existing literature yields mixed findings. For example, based on two studies on YouTube, Lawrence *et al*. (2013) found that compared to MGA, the UGA benefits from consumers' cognitive, emotional, and personal engagement. However, Sabri and Michel (2014) suggested that credible and humorous UGAs in Facebook pages may harm consumers' brand attitude. Furthermore, Steyn *et al*. (2011) assumed that consumers have more positive feelings towards the UGA than the MGA on video-sharing websites, but no overwhelming evidence was presented. These mixed findings indicate that the roles of MGA and UGA are context-dependent, and the distinctive characteristics of closed SNSs warrant specific investigation (Lee and Lee, 2017). Second, research on advertising campaigns in the closed SNS context is limited. Choi and Lee (2017) identified the differential impacts of MGA and UGA on consumers' cognitive and affective trust. Despite such insights, the reasons for the different effectiveness of MGA and UGA in this context remain unclear. Third, although there is an abundance of literature on consumers' reactions (including cognitive and affective perceptions) to advertising (Kim and Han, 2014; Martins *et al*., 2019; Taylor *et al*., 2011), their indirect roles in advertising effectiveness are understudied. To better understand the advertising effectiveness of MGA and UGA in closed SNSs, we thus focus on the key research question: *What is the underlying psychological process that explains the relationship between ad type (MGA* versus *UGA) and advertising effectiveness in closed SNSs?*

The conceptual model is established by using the stimulus-organism-response (S-O-R) model. It is verified by a scenario-based experiment of 403 WeChat users in China. Our research makes several theoretical contributions. First, it contributes to the literature on social media advertising by incorporating closed SNSs as a new context. Second, using the S-O-R model, this research clearly depicts consumers' psychological mechanisms related to MGA and UGA in closed SNSs, providing deep insights into their differential effectiveness. Third, this study contributes to S-O-R theory by extending it to the social media advertising context. Fourth, our research advances the scholarly understanding of advertising in closed SNSs by identifying four advertising elements

as the bridge between ad type and advertising effectiveness. Finally, our findings offer valuable practical implications for practitioners in conducting advertising campaigns in closed SNSs.

Theoretical background

Closed social network sites

Recently, closed SNSs have become a popular advertising channel because they can facilitate advertisers to target potential customers through the social networks of people with similar backgrounds and preferences (Kontsevaia and Berger, 2016). For instance, WeChat, China's largest closed SNS, has attracted millions of companies to participate in its advertising program and brought them sales growth (Chu *et al*., 2019). Different from open SNSs, which are conceptualized as stranger communities, closed SNSs emphasize users' sense of belongingness and are seen as acquaintance communities (Shu *et al*., 2017). Table I details several key differences between closed and open SNSs. Specifically, although they aim to build and reinforce online human relationships, users' social circles on the former are more private and exclusive. Furthermore, unlike open SNSs, where users can follow anyone they like without permission, closed SNSs require users to request permission to enter another user's circle. In addition, people use closed SNSs mainly for convenient relationship motives (i.e., enhancing relationships with acquaintances), and they have a higher percentage of family members as friends in such SNSs. Correspondingly, on closed SNSs, daily life dynamics account for a higher percentage than gossip and opinions on current events (Lee and Lee, 2017).

Considering the differences between closed and open SNSs, generalizing the conclusions from the former to the latter may be problematic. Additionally, to date, very few studies have examined firms' marketing communication strategies in closed SNSs (Choi and Lee, 2017; Chu *et al*., 2019; Yu *et al*., 2020). To address this research gap, our paper focuses on advertising in closed SNSs.

---Insert Table I Here---

Marketer- and user-generated advertisements

The barriers between marketers and users in creating social media ads have gradually dissolved with the availability of online technical tools (Ertimur and Gilly, 2012). Via the ad platforms of SNSs, marketers can deliver targeted ads to consumers based on big data analysis (Yu *et al*., 2020). Generally, consumers regard such personalized ads as marketing messages (i.e., MGAs) (Chu *et al*., 2019). In addition, users can create, produce, and disseminate ads (i.e., UGAs) using their mobile phones or computers (Ertimur and Gilly, 2012). UGAs are similar to traditional ads in appearance, sense, form, and intent but are viewed as consumer-to-consumer communications. This is because their creators are personalized, identifiable, and relatable entities related to consumers, making them more resonant and authentic than MGAs (Thompson and Malaviya, 2013). Both MGAs and UGAs can be utilized by merchants to promote their products or brands.

Although previous studies have compared the effectiveness of MGA and UGA, the existing literature has yielded mixed findings (see Table II). For example, the role of credibility received uneven support. Specifically, Lee *et al*. (2017) found that consumers tend to trust the UGA rather than the MGA; the UGA is more likely to arouse consumers' positive attitudes towards ads and brands. However, Sabri and Michel (2014) argued that the credible UGA with humour may harm consumers' brand attitudes. In addition, inconsistencies and contradictions also exist within a single study. For instance, Steyn *et al*. (2011) suggested that consumers have more positive feelings towards the UGA but presented no overwhelming evidence. Thompson and Malaviya (2013) found that UGAs can trigger audiences' two opposing reaction mechanisms. On the one hand, when consumers consider the design capabilities of ad creators, they feel that UGAs are not more trustworthy than MGAs. On the other hand, when consumers perceive their similarities with ad creators, they will positively evaluate UGAs. These mixed findings indicate that the roles of MGA and UGA are context-dependent and suggest room for theory development.

---Insert Table II Here---

To date, there is little theoretical work focusing on consumers' environmental psychology orientation when facing advertising stimuli, especially in closed SNSs, which emphasize privacy protection and community belonging. Hence, from a theoretical perspective, this offers the

opportunity to apply the S-O-R model to better understand how the ad type (i.e., MGA versus UGA) as a stimulus influences advertising effectiveness in closed SNSs, as discussed next.

Stimulus-organism-response model

The S-O-R model is a theory of environmental psychology that posits that environmental stimuli influence people's psychological reactions (organism), thereby determining their behaviour (response) (Kawaf and Tagg, 2012). This model has been widely used in offline or online consumption environments. For instance, Cui *et al*. (2016) utilized this lens to explore the mediating roles of bidders' perceptions between auction stimuli and their loyalty to auction websites. Additionally, researchers in the social media area found that the social cues and interactive features of social platforms exert significant impacts on users' attitudes and behaviour (Fang *et al*., 2020; Lin *et al*., 2020). This study further extends the S-O-R model to the social media advertising context by theorizing how the ad type stimulates consumers' reactions and responses. As Figure 1 shows, by conceptualizing the three components of the S-O-R model in the current context, we establish the research model of our study.

---Insert Figure 1 Here---

Advertisement types as stimuli

MGAs and UGAs currently coexist in closed SNSs to promote products. The MGA has targeted, localized, and optimized features, while the UGA relies on interactive advantages, encouraging audiences to actively converse with creators (Kontsevaia and Berger, 2016). In closed SNSs, where daily life dynamics account for a higher proportion of content, consumers can easily identify which message is a MGA and which message is a UGA (Goh *et al*., 2013). That is, consumers are more sensitive to the ad type in the current context. As Friestad and Wright (1994) suggested, if audiences recognize the content as the ad, their coping mechanisms will be triggered. We thus assume that MGA and UGA may trigger different consumer reactions since they are regarded as different marketing communications, which is worthy of in-depth study. As such, we identify the

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ad type (i.e., MGA versus UGA) as a stimulus and explore its impacts on consumers' perceptions (organism) and behavioural responses in closed SNSs, which are discussed next.

Consumers' cognitive and affective perceptions as organism

Drawing on the related literature (Ducoffe, 1995; Taylor *et al*., 2011; Tsang *et al*., 2004), we identify consumers' cognitive and affective perceptions of advertising as their reactions to the ad type. Specifically, cognitive reactions are defined as individuals' mental processes in the process of interacting with stimuli; they include perceived informativeness and credibility. Affective reactions are regarded as individuals' emotional responses occurring when they interact with stimuli; they include perceived entertainment and irritation (Ducoffe, 1995). Although these four perceptions have been confirmed as important factors influencing advertising effectiveness (Kim and Han, 2014; Martins *et al*., 2019; Taylor *et al*., 2011), little research has explored their indirect effects between advertising stimuli and consumers' responses. Hence, we propose that the ad type affects consumers' perceived informativeness, credibility, entertainment, and irritation towards advertising, thereby influencing advertising effectiveness.

Advertising effectiveness as responses

In the era of new media advertising, the effectiveness of advertising is mainly reflected in consumers' positive responses to ads (Reynolds and Phillips, 2019). Although the ultimate effectiveness of advertising is manifested in actual purchases (Mehta, 1994), in closed SNSs, where users usually share information rather than shopping, advertising effectiveness can be captured by consumers' tendencies to buy. Drawing on prior research, we conceptualize it as a multidimensional construct that includes consumers' attitudes towards ads and brands as well as purchase intentions. Specifically, attitude towards ads refers to individual evaluations, emotional feelings, and action tendencies towards a particular ad exposure (Leung *et al*., 2013). Attitude towards brand denotes a consumer's favourable or unfavourable tendency towards the specific brand in the ad (Phelps and Hoy, 1996). Purchase intention directly reflects the strength of a consumer's conscious purchase plan (Bauer *et al*., 2005). Since these variables are all important

metrics for consumers' tendencies to purchase, using them can provide a more complete understanding of advertising effectiveness in closed SNSs.

Hypotheses

Advertisement types and cognitive reactions

When conducting advertising campaigns, marketers tend to provide general product introduction in their ads, encouraging consumers to click for detailed descriptions (Ertimur and Gilly, 2012). This not only attracts consumers' attention but also reduces information asymmetry (Goh *et al*., 2013). In our context, however, the unique features of UGAs can offer consumers additional information, including the creators' background and purchase experiences (Thompson and Malaviya, 2013). Furthermore, as member-to-member communications, such ads include more intuitive product introduction, which is directly relevant to consumers' purchase decisions (Chen and Xie, 2008). Hence, in closed SNSs, UGAs have an information advantage over MGAs.

> **H1**: *The advertisement type affects consumers' perceived informativeness, of which the UGA is a stronger predictor than the MGA.*

Previous research has found that consumers' perceived credibility of online content is affected by its source, and they tend to believe messages from other consumers rather than from marketers, especially in closed SNSs (Kim *et al*., 2021; Zhang *et al*., 2017). Specifically, because the generators of UGAs and consumers share similar backgrounds and preferences, such close social distance promotes consumers to assign higher credibility to UGAs (Steyn *et al*., 2011). In contrast, due to the greater social distance between merchants and consumers, consumers value the abstract and generalized features of MGAs such as inductivity or persuasiveness (Trope *et al*., 2007). Hence, consumers may feel that marketers overstate the product's benefits to induce them to purchase, whereas fellow consumers have little incentive for such misrepresentation (Park *et al*., 2007).

> **H2**: *The advertisement type affects consumers' perceived credibility, of which the UGA is a stronger predictor than the MGA.*

Advertisement types and affective reactions

To attract more consumers, users focus on offering pure entertainment value from the consumer perspective, whereas marketers usually use attractive titles and pictures to highlight entertainment (Steyn *et al*., 2011). According to Lawrence *et al*. (2013), compared to MGA, the UGA makes it easier for consumers to become involved and creates more emotional resonance. Specifically, because the UGA contains creators' true feelings, such an ad can show the relevance of a product to consumers' lives. In addition, by shortening consumers' psychological distance to advertising messages and activating their mental associations, the UGA can provide a more profound entertainment experience than the MGA. Thus, consumers' assessments of UGAs are often subjective and affect-driven, while their assessments of MGAs are usually objective (Thompson and Malaviya, 2013).

> *H3: The advertisement type affects consumers' perceived entertainment, of which the UGA is a stronger predictor than the MGA.*

In closed SNSs, targeted ads from marketers are considered unwelcome by consumers due to privacy issues (Ertimur and Gilly, 2012). Additionally, because consumers know little about the creator of MGAs, they need to take more effort to evaluate or process this type of ad. Therefore, a MGA may make consumers feel disgusted due to the strangeness it brings (Choi and Lee, 2017). However, consumers are more willing to accept messages created by fellow users since the social distance between them is relatively close in closed SNSs. Hence, in the present context highlighting the acquaintance community, the UGA is more easily accepted by consumers than the MGA.

> *H4: The advertisement type affects consumers' perceived irritation, of which the MGA is a stronger predictor than the UGA.*

Cognitive perceptions and advertising effectiveness

The essential function of advertising is to provide consumers with brand or product information to persuade them to buy; consumers' search and use of information is a significant predictor of their subsequent behaviour (Lee *et al*., 2011; Mehta, 1994). Prior research has confirmed the impact of informativeness on advertising messages. For example, Tsang *et al*. (2004) found that

informativeness significantly affects consumers' attitudes towards mobile advertising. In addition, Gao and Koufaris (2006) found that consumers' perceived informativeness is positively related to their attitudes towards a commercial website. Kim and Han (2014) posited that consumers will respond positively to the marketing message only when they obtain the information they need. Moreover, when consumers learn more about the product from the ad, they will be more interested in the product and willing to buy it (Soberman, 2004). Hence, consumers' perceived informativeness positively affects advertising effectiveness.

H5: Perceived informativeness is positively associated with advertising effectiveness.

Perceived credibility refers to a person's affirmation of the veracity of received information (Zhang *et al*., 2017). A credible ad does not exaggerate the advantages of the product or hide its disadvantages; it helps consumers evaluate the value of the product (Kim and Han, 2014). Moreover, advertising credibility can reduce consumers' subjective risk perception, especially in the case of asymmetric information (Tsang *et al*., 2004; Zhang *et al*., 2017). As Tsang *et al*. (2004) proposed, advertising credibility is an important factor influencing consumers' attitudes and intentions towards mobile ads, and it may positively affect advertising effectiveness in the current context. Only when consumers believe that the content is trustworthy and nondeceptive can they accept an ad.

H6: Perceived credibility is positively associated with advertising effectiveness.

Affective perceptions and advertising effectiveness

According to Ducoffe (1995), the entertainment of advertising is a crucial factor for its value and effectiveness. Generally, highly entertaining ads can attract consumers' attention and provide them with enjoyment, which helps to enhance consumers' positive intention (Sinkovics *et al*., 2012). Following this viewpoint, in the current context, consumers' sense of enjoyment can lead to positive attitudes towards ads (Sinkovics *et al*., 2012; Xu *et al*., 2009). Furthermore, this sense of enjoyment also reflects the potential value of the advertised brand to consumers, which encourages consumers to make purchase decisions (Kim and Han, 2014; Xu *et al*., 2009). Consumers' perceived entertainment therefore positively affects advertising effectiveness.

H7*: Perceived entertainment is positively associated with advertising effectiveness.*

Irritation is viewed as a negative psychological reaction of consumers to ads; it can cause consumers to avoid future advertising stimuli (Tsang *et al*., 2004). Prior studies have found that irritation can reduce advertising effectiveness (Kim and Han, 2014; Taylor *et al*., 2011; Tsang *et al*., 2004). Due to the "private" nature of closed SNSs, unexpected or unsolicited advertising content may cause discomfort to consumers, especially when the ads interfere with their ongoing activities in their "personal space". Thus, if consumers receive unexpected ads, they will feel irritated and respond negatively to these ads (Choi and Lee, 2017).

H8*: Perceived irritation is negatively associated with advertising effectiveness.*

Methodology

Manipulation

We chose WeChat as the context of this study. It is the most widely used closed SNS in China, with over 1 billion monthly active users. Thousands of marketers and users advertise on it, making it the largest social marketing platform in China (Yu *et al*., 2020). Following the studies of Aribarg and Schwartz (2020) and Steyn *et al*. (2010), which investigated online advertising, we conducted a scenario-based experiment. Specifically, taking the possible effects of product type, brand popularity, creator characteristics, and ad likability into account (Choi and Lee, 2017; Steyn *et al*., 2010), we designed the scenarios instead of directly using the existing MGA and UGA in WeChat. The steps for manipulating the scenarios are as follows.

First, to control for potential product effects, we chose facial tissue, which is closely related to people's everyday lives, as the advertised product. Second, to heighten the external validity, we chose a real brand and used texts and pictures from its actual campaigns to design ads. Furthermore, considering the positive impact of consumers' brand familiarity on advertising effectiveness (Steyn *et al*., 2010), a small advisory group of consumers was selected to review several shortlisted brands of tissue. Through analysis and exclusion, the advisory group selected a brand named "Wuro", a relatively small and new brand in the Chinese tissue market. Third, MGAs and UGAs often differ in terms of quality and style due to their creators' different roles, abilities and external support

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(Choi and Lee, 2017; Lawrence *et al*., 2013). Hence, to make consumers perceive the scenarios as real, we imitated the typical examples of MGA and UGA in WeChat, products in which tissue and other daily utilitarian products are included. Finally, to control the effect of ad likeability, we invited four marketing academics to review the short-listed ads without any source labelling. Through discussion and elimination, they selected two ads (i.e., MGA and UGA for the experiment) (see Figures 2 and 3), which are neutral on overall likability.

---Insert Figure 2 Here---

---Insert Figure 3 Here---

Following these steps, fifty-three WeChat users were recruited to participate in the pilot test, with female participants accounting for 56.604% of the total participants. They were asked to view the two ads on their mobile phones and to identify whether they were MGA or UGA. The results show that the participants correctly perceived these two types of ads. Thus, the manipulation was successful.

Procedure

We collaborated with Sojump (https://www.wjx.cn/), a professional online survey company in China that focuses on offering users self-designed questionnaires and surveys (Chu *et al*., 2019). Considering the popularity of WeChat in China, subjects were randomly selected by Sojump from its large panel database over a 12-day period (25 May to 5 June 2020). After completing the survey, each subject received a financial reward of 20 RMB (approximately U$ 3). First, the randomly selected panel members received a cover letter that introduced the survey requirements ("the subject has used WeChat in the past week" and "the subject has seen ads on WeChat in the past week"), respondents' privacy protection issues, their right to know the results, and the financial reward. Then, the participants chose whether to participate in the survey and replied to Sojump. The company only sent questionnaires to qualified participants after receiving their positive responses.

The questionnaire comprised three parts. The first part presented the research scenarios, in which participants randomly browsed one of the two ads and answered whether they knew the advertised brand. If the participant's answer was "yes", the questionnaire was automatically submitted and marked as invalid. The second part was a scale for measuring perceived informativeness, credibility, entertainment, irritation, and advertising effectiveness. The third part measured the characteristics of the respondents.

Five hundred fifty questionnaires were distributed, and 463 were returned. After removing invalid or questionable responses (i.e., knew the advertised brand, strongly agreed or strongly disagreed with all questions), 403 valid samples were obtained with a valid response rate of 87.041%. Of the respondents, 62.531% were female. Furthermore, 90.323% were 18-38 years old, which is in line with the finding that young users are the most active WeChat users in China (Lien *et al*., 2017). A total of 50.868% of the respondents had used WeChat for more than five years, followed by those who used WeChat for four to five years (19.851%). Only 6.452% of the respondents had used WeChat for less than one hour per day, showing that WeChat occupied an important position in most users' lives. Table III shows the respondents' WeChat usage and demographic details.

---Insert Table III Here---

Measurement

The constructs were measured via a seven-point Likert scale. We adapted the measurement items from previous research, with minor changes in wording to fit the current context (see Table IV). We first developed an English questionnaire and invited a professional translator who did not know the objective of our research to translate it into Chinese. It was then translated back into an English version by another translator. There were no semantic discrepancies between the two English questionnaires. We also invited five academic experts in the social media advertising field to review the questionnaire to refine its structure and item wording.

---Insert Table IV Here---

The measurements of the constructs are as follows. First, we adapted items from Kim *et al.* (2010) to measure perceived informativeness and entertainment. Second, we measured perceived credibility and irritation following the study of Kim and Han (2014). Third, we developed items for advertising effectiveness using a threefold construct that has been confirmed to be appropriate in the social media context. Specifically, we measured attitude towards the ad and brand as well as purchase intention following the scale of attitude towards wireless ads in Okazaki (2007), the scale of brand attitude towards internet banner advertising in Wu *et al.* (2008), and the scale of consumers' purchase intention after viewing social media ads in Wen *et al.* (2009). One question, "Do you agree that the mobile data charge may be increased in the future?", was added as a marker variable to examine common method bias in the questionnaire. In addition to the above variables, we included gender, age, level of education, income, time spent using WeChat, and frequency of using WeChat as control variables in our model.

Measurement model assessment

We assessed the measurement and structural models using SmartPLS 3.0 because it enables researchers to simultaneously estimate all path coefficients in a research model, avoiding inconsistent parameter estimates for equations (Hair *et al.*, 2011; Tenenhaus *et al.*, 2005). First, following Hair *et al.* (2017), if the value for Cronbach's alpha exceeds the threshold of 0.7, reliability is established. As Table V shows, the Cronbach's alphas all exceed the criterion of 0.7, demonstrating a high level of reliability.

---Insert Table V Here---

Second, three tests were used to examine the convergent validity, where (1) factor loadings of items should exceed 0.7; (2) composite reliabilities of constructs should be greater than 0.7; and (3) for each construct, average variance extracted (AVE) by construct should exceed 0.5 (Hair *et al.*, 2017). As Tables V and VI show, the composite reliabilities all exceed 0.7, the AVE by constructs all exceed 0.5, and each item loads highest on its own construct with a loading of 0.7 or higher, suggesting that convergent validity is supported. In addition, according to Fornell and Larcker (1981), for any construct in the research model, if its square root of the AVE exceeds its

correlations with other constructs, then discriminant validity is established. Table VII reports the square roots of AVE of constructs and the correlations between constructs. Notably, the square roots of AVE are shown to exceed the correlations between constructs. Thus, discriminant validity is supported in this research. Third, following Hair *et al*. (2011), we assessed the level of multicollinearity between the constructs. The results show that the variance inflation factor (VIF) is below five (the recommended threshold), indicating that multicollinearity is not a potential problem.

---Insert Table VI Here---

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Finally, we conducted Harman's one-factor test using SPSS 25.0 to evaluate whether common method bias was present in our research. If one factor explains more than 50% of the total item variance, there exists a serious common method bias problem (Podsakoff *et al*., 2003). The results show that the largest proportion of the total variance explained by one factor is 32.842%, indicating that common method bias does not pose a threat in this paper. Furthermore, a partial correlation technique was used to confirm the above results. According to Lindell and Whitney (2001), if a variable is theoretically uncorrelated with other variables in the model, this variable can be used as a marker variable, and any association between it and any other variable can be attributed to common method bias. As Table VII shows, the relationships between the marker variable and other variables are not significant. Additionally, we find no change in the relationships between the core variables after controlling for the marker variable, which confirms the results of the one-factor test.

Structural model assessment

Following the establishment of the measurement model, partial least squares structural equation modelling (PLS-SEM) was utilized to test the structural model. PLS-SEM is appropriate for estimating causal models and predicting key target constructs (Hair *et al*., 2011), and it allows researchers to evaluate both the total effect and the indirect effect (Hair *et al*., 2017). First, the R^2 of advertising effectiveness is 83.858%, indicating a high explanatory power of our research model.

Second, as shown in Figure 4, no control variable has a significant impact on advertising effectiveness. Third, ad type (the MGA is coded as 1, the UGA is coded as 0) significantly influences perceived informativeness (β = -0.141, t = 2.890), credibility (β = -0.276, t = 6.024), entertainment (β = -0.185, t = 3.755), and irritation (β = 0.116, t = 2.339). Finally, as expected, perceived informativeness (β = 0.161, t = 5.598), credibility (β = 0.465, t = 12.541), and entertainment (β = 0.317, t = 9.417) have significantly positive effects on advertising effectiveness, which are compared in the Appendix. In contrast, perceived irritation (β = -0.135, t = 5.489) has a significantly negative effect on advertising effectiveness. Thus, all hypotheses are supported.

<center>---Insert Figure 4 Here---</center>

In addition, we tested the indirect effects of consumers' perceptions of ads in the model. As shown in Table VIII, the results of PLS-SEM show that the intervals at the 97.5% level of confidence obtained from the bootstrapping procedure with 5000 samples do not include 0, suggesting that the indirect effects of these perceptions are significant (Hayes and Preacher, 2014). Thus, we conclude that they all mediate the relationship between ad type and advertising effectiveness.

<center>---Insert Table VIII Here---</center>

Discussion

Discussion of findings

Our empirical findings are not only consistent with previous literature (Kim and Han, 2014; Martins *et al*., 2019; Sinkovics *et al*., 2012) but also provide novel insights. Specifically, the UGA has a stronger effect on advertising informativeness than the MGA. This is because this type of ad presents the creator's identity, sharing intention, and purchase experience (Thompson and Malaviya, 2013). Furthermore, compared with MGA, the UGA makes consumers perceive it as more credible due to the close social distance between consumers and its creator (Lee and Lee, 2017). Additionally, despite the importance of entertainment value to MGAs (Ertimur and Gilly, 2012), our results indicate that the UGA offers more entertainment experiences since it can easily arouse audience engagement (Lawrence *et al*., 2013). As expected, customers feel that the MGA is

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more intrusive than the UGA. This may be related to the private nature of closed SNSs, which facilitates users to interact with acquaintances and block strangers.

In addition, our findings confirm the positive effects of consumers' perceived informativeness, credibility, and entertainment and the negative effect of perceived irritation on advertising effectiveness. Specifically, the essential function of advertising is to provide consumers with brand and product information. Thus, the quality of information affects consumers' attitudes and behaviour. Meanwhile, consumers attach great importance to advertising credibility and avoid exaggerated and deceptive content. In addition, the entertainment value of advertising is essential to persuading consumers because it can bring them positive experiences (Sinkovics *et al.*, 2012). However, when consumers feel invaded by an ad, their attitudes and intentions become negative, which is in line with the viewpoint of Kim and Han (2014).

Theoretical implications

This study adds to extant knowledge in four important ways. First, in recent years, closed SNSs have become popular channels for disseminating ads (Yu *et al.*, 2020; Zhang *et al.*, 2016). However, previous studies have generally taken a unified and monolithic view of open and closed SNSs, obscuring their distinct features (Gordon *et al.*, 2019; Lee *et al.*, 2018). Considering the increasing ubiquity of closed SNSs in people's lives, more attention should be given to marketing strategies in this emerging advertising landscape (Choi and Lee, 2017). Hence, this study echoes the need to address this gap and enriches the social media advertising literature by investigating advertising in more diverse types of SNSs.

Second, although previous research has compared MGA and UGA (Ertimur and Gilly, 2012; Lawrence *et al.*, 2013), there is little theoretical work investigating the underlying mechanism by which ad type influences advertising effectiveness. Using the S-O-R model, this study focuses on consumers' environmental psychology orientation, depicting the process in which ad type stimulates consumers' reactions and in turn influences their responses. By doing so, we offer fresh and deep insights into the differential effectiveness of MGA and UGA.

Third, although researchers have introduced the S-O-R model into the social media context (Fang *et al*., 2020; Lin *et al*., 2020), to our knowledge, no study has utilized this lens to investigate advertising in such a context. Taking a step further, we extend the model to the social media advertising context, which contributes to S-O-R theory.

Finally, prior studies have confirmed the impacts of consumers' cognitive and affective perceptions on advertising effectiveness (Kim and Han, 2014; Martins *et al*., 2019; Taylor *et al*., 2011). However, little research has explored their indirect effects (Choi and Lee, 2017). In this study, we identify these perceptions as the bridge between advertising stimuli and advertising effectiveness. The results deepen our understanding of advertising in closed SNSs and thus contribute to the advertising literature.

Managerial implications

This study also provides several valuable implications for practitioners. First, the results show that compared with MGA, the UGA is more informative, credible, and enjoyable to consumers in closed SNSs. This is because its creator is regarded as an in-group member. As such, if a merchant wants to promote a new product in closed SNSs, encouraging users' social marketing would be more effective than purchasing ad platform services. Second, our findings confirm that the MGA is a more intrusive ad form. Since marketers are out-group members in closed SNSs (Choi and Lee, 2017), targeted ads coming from them can easily arouse consumers' alarm, irritation, or disgust. In this case, an appropriate strategy for marketers is to imitate what users post to blend the ads into such environments. Third, we confirm the impacts of different advertising elements on advertising effectiveness. Based on this, when conducting advertising campaigns in closed SNSs, advertisers need to enrich the information of ads, avoid exaggerated descriptions of products and strike a balance between visual attention and ad clicks.

Limitations and future work

There are several limitations in our research that provide avenues for future research. First, because we collected data from WeChat users in China to examine the research model, selection bias may

cause the results to have limited generalizability. Future researchers could examine the model based on other closed SNSs (e.g., Kakao Talk and Path) and in a cross-cultural setting, which would help to check the boundary conditions of our results. Second, although our study identifies consumers' cognitive and affective reactions as the organism of the S-O-R model, future research could extend the scope to social reactions (e.g., consumers' perceived social interaction and personal identity). Investigating these variables could provide a more comprehensive explanation of consumers' responses. Third, as product type (i.e., utilitarian versus hedonic) can also influence consumers' evaluation of an ad, future researchers could explore the impact of its interaction with ad type on advertising effectiveness. Finally, the scenario-based approach is a simplification of the real context. Field experiments in which participants encounter more realistic experiences would provide more robust findings.

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Appendix. The results of path comparison tests

Following the path comparison method proposed by Cohen *et al*. (2003), we further explored the relative effects of consumers' perceived informativeness, credibility, and entertainment on advertising effectiveness. As Table IX shows, we find that both credibility and entertainment have stronger impacts than informativeness, while the difference between the impacts of credibility and entertainment is not significant. This indicates that advertising credibility and entertainment are more important to a successful ad than informativeness in the closed SNS context.

---Insert Table IX Here---

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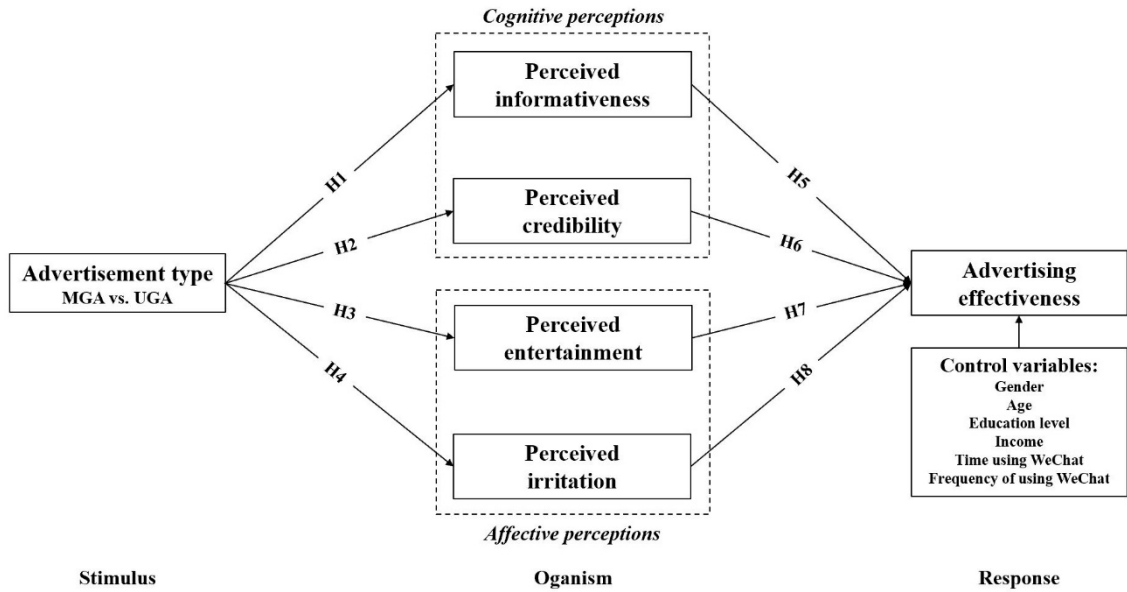
Figure 1 The research model

The avatar is the brand logo.

The publisher's name is the brand name.

The MGA is marked with an "Advertisement" logo.

The English meaning of the text is that "This tissue is made of bamboo fibre, which is natural and environmentally friendly".

The pictures are taken from the advertising campaigns. They show different types of products.

To provide subjects with a more realistic browsing experience on WeChat, the MGA is placed in the middle of two other posts which are only half displayed.

Users can click the hyperlink to get more information about the brand and product in the MGA.

Users can click on the info button to comment on or like the MGA.

Figure 2 Operationalization of MGA

The avatar is a common cartoon picture, which is often used as a WeChat avatar in China.

The publisher's name is "Friend XX" to indicate that the UGA is created and published by a friend.

The English meaning of the text is that "This tissue is my favourite because it is natural and environmentally friendly. It is very comfortable to use. I will continue to buy Wuro tissue".

The pictures of UGA are taken from the advertising campaigns. The first picture shows that the tissue is made of bamboo fibre. The other three pictures simply show different products.

To provide subjects with a more realistic browsing experience on WeChat, the UGA is placed in the middle of two other posts which are only half displayed.

Users can click on the info button to comment on or like the UGA.

Figure 3 Operationalization of UGA
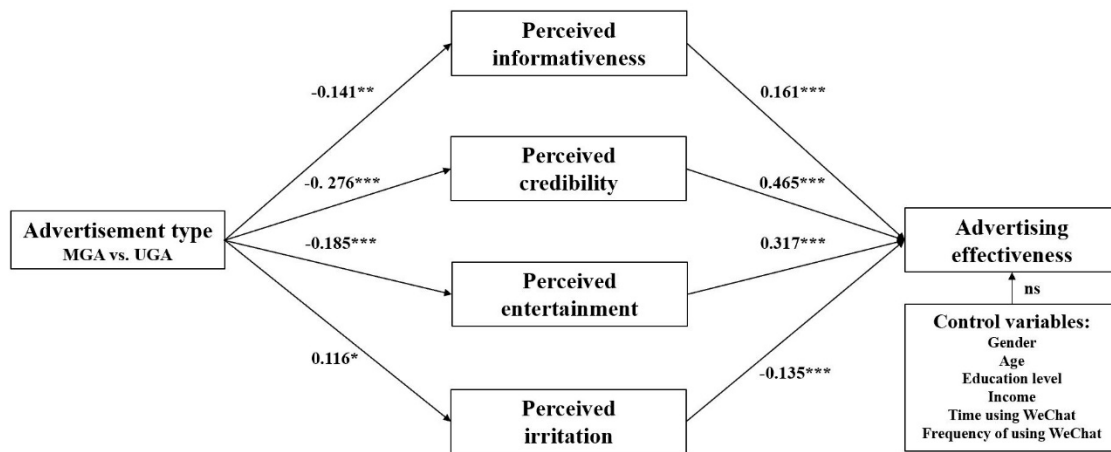
Note: *: p < 0.05; **: p < 0.01; ***: p < 0.001; ns: not significant.

Figure 4 Results of the structural model

Table I Comparison between closed SNSs and open SNSs

Criteria	Closed SNSs	Open SNSs
User social circles	Private and exclusive	Public and inclusive
Access permissions	Users must request permission to be in another user's circle	Users can follow anyone they like without permission
Friend types	Higher percentage of acquaintances	Higher percentage of strangers and celebrities
Use motives	Enhance relationships with acquaintances	Gain entertainment and information
Content types	Higher percentage of daily dynamics of life	Higher percentage of humour/gossip and opinions on society/current events

Table II Prior studies on MGA and UGA

Article	Context	Independent variable	Mediating variable	Dependent variable	Findings
Campbell *et al.* (2011)	Video-hosting sites	UGAs	N/A	Inquiry; Laudation; Debate; Flame	UGAs can cause both positive and negative responses from consumers
Chatterjee (2011)	Open SNSs	Message source; Consumers relationship with SNS; Influencers' participation in SNS	N/A	Recommendation; Referral	Compared to MGAs, UGAs are more likely to be recommended
Choi and Lee (2017)	Closed SNSs	Ad type; SNS type	N/A	Cognitive trust; Emotional trust	UGAs perform better than MGAs in affecting consumers' cognitive trust, while MGAs lead to stronger affective trust of consumers
Ertimur and Gilly (2012)	Online websites	Contest UGAs; Unsolicited UGAs; Company ads	N/A	Authenticity; Credibility; Persuasiveness	Consumers feel that unsolicited UGAs are authentic, but not credible
Lawrence *et al.* (2013)	Open SNSs	UGAs	N/A	Consumers' trust, identification, engagement and quality evaluation; Ad persuasiveness	UGAs are more likely to gain consumers' trust and engagement, thereby garnering the advantage of quality judgement
Lee *et al.* (2017)	Open SNSs	Source credibility	N/A	Attitudes towards ads and brands; Opinion giving	Consumers view UGAs as more credible than MGAs
Pehlivan *et al.* (2011)	Open SNSs	MGAs; UGAs	N/A	Consumers' attitudes toward ads, products and firms	There is no source effect between MGAs and UGAs
Sabri and Michel (2014)	Open SNSs	Advertising credibility; Advertising humour	N/A	Consumers' attitudes and intentions towards ads	UGAs are detrimental for the brand if they are strongly credible and contain humour
Steyn *et al.* (2011)	Video-sharing websites	Ad creator; Ad popularity; Motivation of ad creation	N/A	Consumers' positive feelings	No evidence supports the point that UGAs are preferred over MGAs
Thompson and Malaviya (2013)	Online websites	MGAs; UGAs	Scepticism; Identification	Ad and brand evaluations	Consumers may identify with UGAs or be suspicious of such ads

Table III Sample characteristics (N = 403)

Sample characteristics	Items	Frequency	Percentage
Gender	Male	151	37.469%
	Female	252	62.531%
Age	17 or below	3	0.744%
	18–24	135	33.499%
	25–31	145	35.980%
	32–38	84	20.844%
	39 or above	36	8.933%
Education level	Junior high school and below	3	0.744%
	Technical secondary and high school	15	3.722%
	College	45	11.166%
	Undergraduate degree	280	69.479%
	Master's degree or above	60	14.888%
Income	¥1,000 or below	48	11.911%
	¥1,001–¥3,000	72	17.866%
	¥3,001–¥6,000	107	26.551%
	¥6,001–¥10,000	116	28.784%
	¥10,001 or above	60	14.888%
Time using WeChat	Less than 1 year	2	0.496%
	1-2 years	15	3.722%
	2-3 years	44	10.918%
	3-4 years	57	14.144%
	4-5 years	80	19.851%
	More than 5 years	205	50.868%
Frequency of using WeChat	Less than 1 hour	26	6.452%
	1-2 hours	99	24.556%
	2-3 hours	103	25.558%
	3-4 hours	71	17.618%
	4-5 hours	32	7.940%
	More than 5 hours	72	17.866%

Table IV Measurement items for study

Measure items

Perceived informativeness (Kim *et al*., 2010)

INF1   The advertisement provides relevant product information.
INF2   The advertisement provides timely product information.
INF3   The advertisement provides accurate product information.

Perceived credibility (Kim and Han, 2014)

CRE1   I feel that the advertisement is convincing.
CRE2   I feel that the advertisement is believable.
CRE3   I feel that the advertisement is credible.

Perceived entertainment (Kim *et al*., 2010)

ENT1   The advertisement is exciting.
ENT2   The advertisement is enjoyable.
ENT3   The advertisement is pleasing.

Perceived irritation (Kim and Han, 2014)

IRR1   I feel that the advertisement is irritating.
IRR2   I feel that the advertisement is annoying.
IRR3   I feel that the advertisement is intrusive.

Advertising effectiveness
Attitude towards ad (Okazaki, 2007)

ATA1   The advertisement is good/bad.
ATA2   The advertisement is favourable/unfavourable.
ATA3   The advertisement is advantageous/not advantageous.
ATA4   The advertisement is wise/foolish.

Attitude towards brand (Wu *et al*., 2008)

ATB1   After viewing the advertisement, I was in love with the advertised brand.
ATB2   After viewing the advertisement, I developed a preference for the brand in the advertisement.
ATB3   After viewing the advertisement, my impression of the product brand was strengthened.

Purchase intention (Wen *et al*., 2009)

PIN1   How likely are you to purchase the product?   Extremely unlikely (1)/extremely likely (7)
PIN2   How willing are you to purchase the product?   Extremely unwilling (1)/extremely willing (7)
PIN3   Do you plan to purchase the product?   Absolutely no (1)/absolutely yes (7)

Table V Descriptive statistics, reliability and validity

Construct Name	Mean	S.D.	Cronbach's α	CR	AVE
Perceived informativeness	4.622	1.333	0.865	0.917	0.786
Perceived credibility	3.849	1.446	0.928	0.954	0.874
Perceived entertainment	3.179	1.473	0.924	0.952	0.868
Perceived irritation	4.364	1.694	0.941	0.962	0.894
Attitude towards ad	4.246	1.474	0.922	0.945	0.811
Attitude towards brand	3.675	1.507	0.894	0.934	0.825
Purchase intention	3.817	1.606	0.931	0.956	0.880

Notes: CR = composite reliability; AVE = average variance extracted.

Table VI Loadings and cross-Loadings

Construct	INF	CRE	ENT	IRR	ATA	ATB	PIN
INF1	**0.843**	0.416	0.337	-0.129	0.459	0.415	0.405
INF2	**0.909**	0.570	0.470	-0.218	0.549	0.573	0.547
INF3	**0.907**	0.635	0.508	-0.283	0.594	0.609	0.567
CRE1	0.584	**0.947**	0.673	-0.458	0.770	0.745	0.767
CRE2	0.585	**0.941**	0.674	-0.449	0.748	0.733	0.748
CRE3	0.573	**0.915**	0.705	-0.475	0.753	0.778	0.756
ENT1	0.479	0.662	**0.919**	-0.454	0.654	0.707	0.701
ENT2	0.472	0.672	**0.940**	-0.492	0.701	0.714	0.703
ENT3	0.459	0.711	**0.936**	-0.521	0.723	0.739	0.729
IRR1	-0.199	-0.435	-0.482	**0.927**	-0.529	-0.434	-0.490
IRR2	-0.261	-0.483	-0.500	**0.955**	-0.580	-0.447	-0.531
IRR3	-0.233	-0.480	-0.508	**0.954**	-0.584	-0.434	-0.529
ATA1	0.599	0.773	0.742	-0.517	**0.908**	0.772	0.768
ATA2	0.544	0.744	0.664	-0.533	**0.926**	0.701	0.741
ATA3	0.570	0.764	0.697	-0.495	**0.917**	0.732	0.752
ATA4	0.469	0.626	0.565	-0.618	**0.848**	0.591	0.644
ATB1	0.570	0.661	0.606	-0.381	0.674	**0.861**	0.715
ATB2	0.564	0.784	0.753	-0.451	0.760	**0.943**	0.820
ATB3	0.535	0.744	0.741	-0.429	0.688	**0.920**	0.806
PIN1	0.550	0.797	0.749	-0.531	0.774	0.831	**0.947**
PIN2	0.540	0.698	0.673	-0.519	0.751	0.765	**0.926**
PIN3	0.541	0.782	0.723	-0.489	0.750	0.823	**0.940**

Notes: INF = Perceived informativeness; CRE = Perceived credibility; ENT = Perceived entertainment; IRR = Perceived irritation; ATA = Attitude towards ad; ATB = Attitude towards brand; PIN = Purchase intention.

Table VII Correlation coefficients

Construct	INF	CRE	ENT	IRR	ATA	ATB	PIN	Marker
INF	0.887							
CRE	0.621**	0.935						
ENT	0.504**	0.732**	0.932					
IRR	-0.245**	-0.493**	-0.526**	0.946				
ATA	0.608**	0.810**	0.744**	-0.597**	0.900			
ATB	0.611**	0.805**	0.773**	-0.463**	0.780**	0.909		
PIN	0.579**	0.810**	0.763**	-0.547**	0.809**	0.860**	0.938	
Marker	0.007	-0.013	-0.037	0.024	0.023	-0.053	-0.011	1.000

Notes: INF = Perceived informativeness; CRE = Perceived credibility; ENT = Perceived entertainment; IRR = Perceived irritation; ATA = Attitude towards ad; ATB = Attitude towards brand; PIN = Purchase intention; Marker is an item to check the common method bias in the study; Diagonal elements are the square root of AVE; Off-diagonal elements are the correlations among constructs; **$p < 0.01$.

Table VIII Mediation examination results

IV	MV	DV	Indirect effect [a] (97.5% confident interval) [b], p value
Ad type	INF	AEF	β = -0.023 (97.5%, CI = -0.043 to -0.007), p < 0.05
Ad type	CRE	AEF	β = -0.128 (97.5%, CI = -0.175 to -0.085), p < 0.001
Ad type	ENT	AEF	β = -0.059 (97.5%, CI = -0.093 to -0.027), p < 0.001
Ad type	IRR	AEF	β = -0.016 (97.5%, CI = -0.031 to -0.002), p < 0.05

Notes: INF = perceived informativeness; CRE = perceived credibility; ENT = perceived entertainment; IRR = perceived irritation; AEF = advertising effectiveness; IV = independent variable; MV = mediating variable; DV = dependent variable; a: level of confidence for all confidence intervals in output is 97.5%; b: number of bootstrap samples for bias corrected bootstrap confidence intervals is 5,000.

Table IX Results of path comparison tests

Path comparison	t-values	Results
$\beta_{INF\text{-}>AEF}$ vs. $\beta_{CRE\text{-}>AEF}$ = 0.161*** vs. 0.465***	2.407	($\surd$) $\beta_{INF\text{-}>AEF}$ < $\beta_{CRE\text{-}>AEF}$
$\beta_{INF\text{-}>AEF}$ vs. $\beta_{ENT\text{-}>AEF}$ = 0.161*** vs. 0.317***	3.222	($\surd$) $\beta_{INF\text{-}>AEF}$ < $\beta_{ENT\text{-}>AEF}$
$\beta_{CRE\text{-}>AEF}$ vs. $\beta_{ENT\text{-}>AEF}$ = 0.465*** vs. 0.317***	0.961	($\times$) $\beta_{CRE\text{-}>AEF}$ > $\beta_{ENT\text{-}>AEF}$

Notes: INF = perceived informativeness; CRE = perceived credibility; ENT = perceived entertainment; AEF = advertising effectiveness.