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The more the better? Strategizing visual elements in social media marketing

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ABSTRACT

Visual elements in social media marketing must be strategically designed and leveraged to elicit viewers' interest, desire, and action. This study aimed to complement the social media marketing literature by investigating how different visual strategies, including visual volume, variety, and dynamism, interactively affect viewers' emotional and behavioral responses to social media posts. Extending the AIDA (awareness, interest, desire, action) model, this study revealed the underlying mechanisms driving the positive effect of visual volume on viewers' intention to visit restaurants after viewing social media posts about the restaurants. Furthermore, consumers' memory of the post content was found to be a significant predecessor of their cognitive (interest), affective (desire), and conative (action) responses to the restaurant. The effect of visual volume was moderated by visual variety and visual dynamism. The positive indirect effect of visual volume on consumers' responses was significant only when the other two visual strategies were not used. This study provides important theoretical and practical contributions to visual social media marketing.

1. Introduction

Social media has grown rapidly over the past few decades. A total of 4.62 billion active social media users, representing 60% of the world's population, spend an average of 2.5 hours a day on social media (Hootsuite, 2022a), and this trend continues to rise. Social media users show an increasing interest in the visual aspects and contents of social media posts (e.g., pictures and videos) compared with textual contents. Since visual contents demonstrate the "mere presence effect" and "picture superiority effect" (Childers & Houston, 1984; Paivio, 1990), they are perceived to be more effective in conveying meaning, simulating experiences, and engaging users (Balomenou & Garrod, 2019; Li & Xie, 2020). The value of visual contents has gradually transformed communication on social media from a largely text-based to a more visual-based structure (Gretzel, 2017); this trend has reshaped content development on social media platforms. For example, Twitter enabled image and video upload functions in 2011, and more than 50% of its content now involves visual elements (Ortiz-Ospina, 2019).

The rise of visual content on social media has also reshaped customers' restaurant selection. Customers tend to browse restaurant reviews and peruse the dishes and dining environment to confer whether the restaurant is worth visiting (Liu et al., 2022; Oliveira & Casais, 2018). They also prefer an "Instagrammable" restaurant to dine at as a way of self-expression (Wong et al., 2019). Restaurants capitalize on such changes in consumers' behaviors by posting more appealing visual content on their social media accounts (Oliveira & Casais, 2018). Managing online presence and displaying appetizing food posts on social media have, thus, become an indispensable online marketing strategy. Although visual content can assist customers in making informed selections, customers encounter a tremendous amount of content on social media, and processing it all is cognitively demanding (Matthes et al., 2020). With limited mental resources at their disposal, customers tend to move quickly from one post to another and selectively view posts that attract their attention. Considering the fierce competition for acquiring customers' attention, marketers need to strategically design posts that can effectively arouse consumers' interest, create desire, and persuade them to consume (Simonetti & Bigne, 2022).

Although several studies have explored social media marketing, many gaps in the literature remain. First, existing research has mostly focused on the textual content of social media posts, particularly, how the presentation of textual content affects receivers' behavior (e.g., Leung et al., 2015; Leung et al., 2017; Stojanovic et al., 2022; Sun et al., 2021). Research focusing on the visual content of posts is scarce, especially, how variations in visual content affect communication or

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persuasion efficacy. Second, studies on visual strategies have identified the effects of visual volume (the number of photos included in a social media post; Bigne et al., 2021), visual variety (the number of attributes covered in a post; Yang et al., 2017), and visual dynamism (perceived movement in the visual element; Zhang et al., 2022) on brand logo design and advertising; however, the findings are inconclusive. For instance, research on online reviews advocates that attaching more photos to a review can increase its helpfulness (Bigne et al., 2021; Hlee et al., 2019; Ma et al., 2018; Yang et al., 2017). However, the advertising literature shows that the inclusion of a larger number of photos in advertisements may not always generate positive effects (Chowdhury et al., 2011; Koh et al., 2020; Song & Baker, 2007). Thus, further empirical investigation on the effect of visual strategies on consumers' emotional and behavioral responses is necessary. Third, most studies have considered one visual strategy at a time (e.g., Kusumasondjaja & Tjiptono, 2019; Wu et al., 2016), but multiple visual strategies can be used simultaneously in a single social media post. However, there is limited knowledge on how different visual strategies can be used to effectively stimulate viewers' consumption intention for a product/service after viewing a social media post.

Furthermore, the underlying mechanism driving the effect of visual content on social media remains unexplored. Theories and models such as the technology acceptance model (TAM) (Lee et al., 2012), uses and gratifications theory (Choi et al., 2016), theory of planned behavior (Thornhill et al., 2017), and congruity theory (Sun et al., 2021) have been used to explain the positive effects of social media marketing. Given that visual content in social media posts may act as advertising stimuli affecting viewers' consumption intention through creating interest and desire, the "Attention-Interest-Desire-Action" (AIDA) model (Lewis, 1899) can be used to evaluate the advertising effectiveness of these contents. While the AIDA model has been extensively applied to understand the effects of marketing stimuli on consumers' responses (Bergkvist & Taylor, 2022), past findings are inconclusive. Some studies support the sequential link from attention to interest, desire, and action, as proposed by the AIDA model (e.g., Song et al., 2021; Wei et al., 2022; Xu & Schrier, 2019), while others did not find full support for the hierarchical effects (e.g., Kang, 2022; Lv et al., 2022; Weng et al., 2021). Furthermore, these studies focused on different media (e.g., live-streaming, food-delivery applications), and the findings may not be directly applicable to visual social media marketing. Thus, whether the AIDA model can be used to explain the effects of various visual strategies on consumers remains unknown.

To address the research gaps identified above, this study examines how visual volume, variety, and dynamism interactively affect viewers' emotional and behavioral responses. Specifically, it (1) investigates the effect of visual volume in food posts on viewers' consumption intention; (2) examines whether the direct effect of visual volume on viewers' consumption intention is moderated by visual variety and visual dynamism; and (3) examines whether visual volume affects viewers' consumption intention through serial mediations of memory (in the post), and interest (in a restaurant), to desire (to visit the restaurant). The results can elucidate the role of each aspect in designing visual content for digital marketing strategies. They can also provide useful information for food-related businesses, such as restaurants, cafes, and social media influencers, to optimize their use of visual content in social media marketing and promotion.

2. Literature review and conceptual development

2.1. Visual social media marketing

Visual communication presents products or services in the form of photos or videos (Kim & Lennon, 2008) that allow customers to tangibly visualize their consumption experience. The term "visual social media marketing" (VSMM) denotes the utilization of visual content on social media for marketing, advertising, and promotional purposes (Fox et al., 2019). Despite users' growing interest in the visual aspects of social media and the increasing trend of using VSMM as a marketing practice, existing research has predominantly focused on the "mere presence effect" and "picture superiority effect" of VSMM. The "mere presence effect" suggests that adding pictures to advertising messages enhances communication effectiveness by attracting customers' attention (Simonetti & Bigne, 2022; Vraga et al., 2016), generating favorable attitudes and consumption intention toward the product (Pennings, Striano, & Oliverio, 2014), and encouraging user engagement on social media (Li & Xie, 2020).

Studies comparing the effects of various presentation formats generally support the "picture superiority effect" (Paivio, 1990). Visual contents stimulate elaborative thinking and, therefore, require less exposure than textual contents to achieve the same effect (Seo et al., 2013). Compared to textual content, visual information gains attention more effectively (Simonetti & Bigne, 2022) and is perceived as more credible and persuasive (Xu et al., 2015). For example, restaurant menus with a picture or video evoke higher mental imagery and desire to eat than menus with an audio narration (Lee & Kim, 2020). Online reviews with pictures are perceived to be more helpful and trustworthy as they provide more vivid information about the product or service (Bigne et al., 2021; Park et al., 2021). Brand logos are also easier to recall than brand names (Ghosh et al., 2022). Since the effect of visual elements is not only limited to the "mere presence effect" and "picture superiority effect," other visual strategies, such as visual volume, visual variety, and visual dynamism, may also influence consumers (Bigne et al., 2021; Yang et al., 2017; Zhang et al., 2022).

2.2. AIDA model and configuration theory

As one of the most extensively used concepts in the marketing and advertising realms, the AIDA model postulates that when exposed to an advertising stimulus, consumers undergo a series of cognitive and affective stages before arriving at the ultimate buying behavior (Strong, 1925). The four stages are: creating awareness in consumers, developing an interest in the product, creating a desire for the product, and finally inducing the action to purchase (Xu & Schrier, 2019). The model also suggests that the number of prospects decreases as they go through each stage. Thus, only a relatively small proportion of consumers remain and, ultimately, purchase after viewing the advertising stimulus (Song et al., 2021). The AIDA model supports an understanding of the changes in customers' emotions and behaviors after viewing visual information on social media.

Though the sequential link from interest, to desire, and action has been empirically confirmed by prior studies (e.g., Wei et al., 2022; Xu & Schrier, 2019), the AIDA model has evolved into others, such as the attention-evaluation-interest-desire (Wei et al., 2022), attention-interest-search-action-share (Pelawi et al., 2019), and attention-interest-evaluation-desire-action models (Weng et al., 2021). Recent studies have also integrated the AIDA model with, for example, the norm activation model (Kang, 2022) and TAM (Song et al., 2021), suggesting the important role of other variables (e.g., product evaluation, information search) in studying consumer decision-making. The current study draws on the AIDA model to investigate the underlying mechanism driving the effects of visual content on social media. Different visual strategies may be used simultaneously in a social media post. In line with the configuration theory (Doty et al., 1993), which denotes three principles—(1) consumers' interest rarely results from one factor alone, (2) factors do not operate separately, and (3) a factor may demonstrate different or opposing effects depending on the context (Greckhamer et al., 2008)—visual strategies should be investigated jointly and interactively. The combinations of different visual characteristics could be more important than their individual effects (Zhu et al., 2020). Thus, the current study extends the AIDA model by integrating the principles of the configuration theory to investigate the joint effects of visual volume, variety, and dynamism on consumers'

cognitive, affective, and conative responses.

2.2.1. Effects of visual volume on visit intention

This study defines visual volume as the amount of visual information in a social media post, measuring it by the number of pictures in a post. The literature on the influence of visual volume remains fragmented and inconclusive. Advertising research suggests that increasing the number of photos may not always generate positive outcomes (Chowdhury et al., 2011; Koh et al., 2020; Song & Baker, 2007) since additional photos may consume greater cognitive effort, inhibiting viewers' elaborative thinking (Rossiter & Percy, 1983). Furthermore, a limited number of photos may be adequate for viewers to infer product quality (Dick et al., 1990). However, research on online reviews advocates that "quantity prevails." Specifically, the number of photos embedded in a review is one of the most influential factors driving its perceived helpfulness or usefulness since visual contents provide more salient information and enhance the diagnosticity of the review (Bigne et al., 2021; Hlee et al., 2019; Li et al., 2022; Ma et al., 2018; Yang et al., 2017).

As food items cannot be evaluated before consumption, the inclusion of more photos in a food post may provide more diagnostic cues for consumers (Larceneux et al., 2018). This helps viewers vividly fantasize about their prospective dining experience and reduces uncertainty induced by information asymmetry (Liu et al., 2022; Yoo & Kim, 2014). Attaching more photos to a food post can also bolster the content's concreteness and credibility. If the photos are positive-valanced, it is likely to induce viewers' positive perception of the restaurant and increase their visit intention (Ryu et al., 2022). Therefore, we propose the following hypothesis:

H1. The visual volume of a post positively influences consumers' visit intention for the cited restaurant.

2.2.2. Serial mediation effects of interest and desire

In the AIDA model, attention is the first phase in the communication process, in which consumers develop awareness of the product or service before their interest and desire is aroused in the subsequent stages. Since the current study focused on the effect of the visual volume of social media posts on consumers' behaviors, participants were exposed to information about one restaurant only and would, presumably, devote their full attention to it; thus, the first phase of attracting attention was irrelevant and was not included. A post with more photos tends to attract more viewers' attention and increases engagement (Rauschnabel et al., 2012). Once they gain awareness, consumers enter the second phase of interest, during which they develop feelings about the product/service (Wijaya, 2013). Thus, consumers who view posts with more (or less) restaurant photos may develop more (or less) interest because they can obtain more information at this stage. The increasing interest generated then provokes a higher level of desire to try the restaurant's food in the next phase, which eventually leads to a higher level of visit intention and consumption behavior (Lv et al., 2022; Xu & Schrier, 2019). Accordingly, the following hypothesis is proposed:

H2. Consumers' interest in and desire to visit the cited restaurant sequentially mediates the relationship between visual volume and visit intention.

2.2.3. Interactive effects of visual volume and variety

Various attributes such as food and beverages, service quality, and dining environment influence consumers' restaurant evaluation and selection (Ha & Jang, 2010; Hwang & Ok, 2013; Kim et al., 2022). When designing a social media post, restauranteurs must include a variety of relevant photos to attract consumers' attention (Oliveira & Casais, 2018). For example, food photos may either capture plated meals or the cooking process, which may generate different effects on consumers (Liu et al., 2022). Photos presenting different restaurant attributes can enhance the visual information available for consumers to confer the quality of the restaurant (Yang et al., 2017); thus, the term "visual variety" denotes the variety of restaurant attributes covered in the visual content, which determines the comprehensiveness of the visual information provided by the social media post.

The strategies of visual volume and variety can be used simultaneously. For example, a restaurant may either post one photo showcasing its signature dish or several photos revealing many different aspects (i.e., food, service, dining environment). Drawing on the configuration theory (Doty et al., 1993) and information richness theory (Daft & Lengel, 1986), visual volume and variety may create a multiplicative effect by presenting more information to viewers and, thus, enhance the effectiveness of the visual stimuli. If a hotel website displays a variety of pictures showing different attributes, customers will develop more favorable attitudes toward the website because they can mentally visualize the hotel and their service experience (Jeong & Choi, 2005). Following this assertion, we postulate the following:

H3. The indirect effect of visual volume on visit intention through interest and desire is positively moderated by visual variety, such that the effect is accentuated (or attenuated) when visual variety is high (or low).

2.2.4. The mediating role of memory

Existing studies have substantiated the importance of including other variables (e.g., product evaluation, information search) in the AIDA model to further understand consumers' decision-making process (Pelawi et al., 2019; Song et al., 2021). They predominantly revolve around the conventional hierarchy-of-effects notion and suggest that the effect of advertising stimuli follows the sequence from cognitive, to affective, and conative stages related to the depicted product. Research suggests that consumers' evaluations of the information in advertising stimuli have been overlooked (Wei et al., 2022; Weng et al., 2021). We extended the conventional approach by including an additional step—evaluation of the post content—to understand consumers' gradual responses toward the visual stimuli appearing in VSMM. Memory was selected since the effectiveness of advertising content is usually assessed based on how well it is recalled or recognized (Kuisma et al., 2010). Memory is widely used as an indicator of various information processing concepts, such as attention, arousal, and learning (Sundar et al., 1999). After brand awareness is built, consumers proceed to the next stage where they learn and remember the advertisement's claims (Smith et al., 2008). Posts are more memorable when consumers process the content deeply before developing interest and intention toward the brand (Smith et al., 2008). Therefore, we argue that consumers' memory of post content is an essential predecessor of their cognitive (i.e., interest), affective (i.e., desire), and conative (i.e., action/visit intention) responses toward the cited restaurant. Thus, we further propose that the sequential effects of visual volume on restaurant selection will be activated only when consumers can recall the post content:

H4. Consumers' memory of the post content mediates the sequential relationship from visual volume to their interest in, desire for, and intention to visit the cited restaurant.

2.2.5. Interactive effects of visual volume and visual dynamism

Visual dynamism is the sense of movement in an image as perceived by viewers (Cian et al., 2014). Perceived dynamism can be conveyed in static images by capturing a moving figure amid motion ("frozen motion") (Freyd, 1983). For example, a static photo of a person jumping can create the impression of actual movement in the viewers' minds. Drawing on the configuration theory, we argue that visual volume interacts with visual dynamism to affect consumers' responses toward the post content and the cited restaurant. Recent research in advertising has documented both positive and negative consequences of embedding dynamic visual elements. Cian et al. (2014) demonstrated that dynamic logos lead to favorable brand evaluations by fostering viewers' engagement. Cian et al. (2015) further showed that dynamic logos more effectively capture consumers' attention and promote responsible

behaviors. However, Zhang et al. (2022) showed that dynamic product presentation diverts attentional resources and diminishes the positive effects of other advertising elements, such as contextual backgrounds and slogans. Dynamic food photos capturing food consumption may distract viewers' cognitive efforts and reduce the positive effects of visual volume. Thus, the following hypothesis is proposed:

H5. The indirect effect of visual volume on consumers' visit intention through memory, interest, and desire is moderated by visual dynamism, such that the effect is attenuated (or accentuated) when visual dynamism is high (or low).

Figure 1 presents this study's research model.

3. Study 1

3.1. Method

We conducted an experiment with a 2 (visual volume: high vs. low) x 2 (visual variety: high vs. low) between-subject design to investigate the effect of visual volume on consumers' intention to visit a restaurant (H1), the sequential mediation effect of interest and desire (H2), and the moderating effect of visual variety on the sequential relationship (H3).

3.1.1. Experimental stimuli and manipulations

Study 1's stimuli were a set of Instagram posts, including manipulations for visual volume and variety. Visual volume was manipulated by changing the number of photos in a post. Since Instagram users can upload a maximum of 10 photos per post, scenarios with high visual volume contained six photos, whereas low visual volume scenarios contained only one. Visual variety was manipulated by varying the number of restaurant attributes in the photos: Posts with high visual variety displayed three attributes (i.e., food, service, and dining environment), whereas posts with low visual variety displayed only one (i.e., food). The photos were selected from actual food-related posts and adjusted to fit the study's context. To enhance realism, four Instagram accounts were created for the four experimental conditions. Apart from visual volume and variety, all other elements (e.g., textual content, number of likes, profile picture) in the four posts were kept identical to avoid any confounding effects. Appendix I includes the screen shots of the four Instagram posts.

3.1.2. Measures

Dependent variable. The dependent variable in Study 1 was "action," which referred to the viewers' intention to visit the restaurant and consume food after exposure to the post. Action was measured using three items adapted from Wei and Lu (2013): *"I think the restaurant presented in the post is worth visiting," "I am willing to visit the restaurant,"* and *"I think I will enjoy dining at this restaurant"* (1: strongly disagree to 7: strongly agree).

Mediating variables. Mediating variables included interest in and desire to visit the restaurant after reading the post. Both variables were measured using items adapted from Wei and Lu (2013): "*I am interested in this restaurant," "I like this restaurant,"* and *"I have a good impression of the restaurant"* measured interest; *"I think I need to visit the restaurant," "I want to visit the restaurant,"* and *"I hope I can visit the restaurant"* measured desire for the restaurant (1: strongly disagree to 7: strongly agree).

Manipulation checks. Manipulation checks for visual volume and variety were performed using measures adapted from Leung (2021). Visual volume was measured by asking participants to respond to the statement *"There are (1: very few to 7: a lot) photos available in this post."* Visual variety was measured by participants' responses to *"The restaurant attributes displayed in this post are (1: very incomprehensive to 7: very comprehensive)."*

Appendix II shows the measurement items of each variable and the corresponding descriptive statistics.

3.1.3. Procedure

The experiment started by introducing the research objective and verifying participants' eligibility. Participants were asked to answer a screening question (i.e., *"How frequently do you use social media to view others' posts?"*) to confirm that they were active social media users. Participants who answered *"I do not use online social media"* were excluded. Eligible participants were asked to imagine browsing their Instagram feed using their smartphone and coming across a post by an influencer they follow. They were then asked to read the post presented on a smartphone and randomly assigned to one of the four experimental conditions. After viewing the assigned post, participants responded to

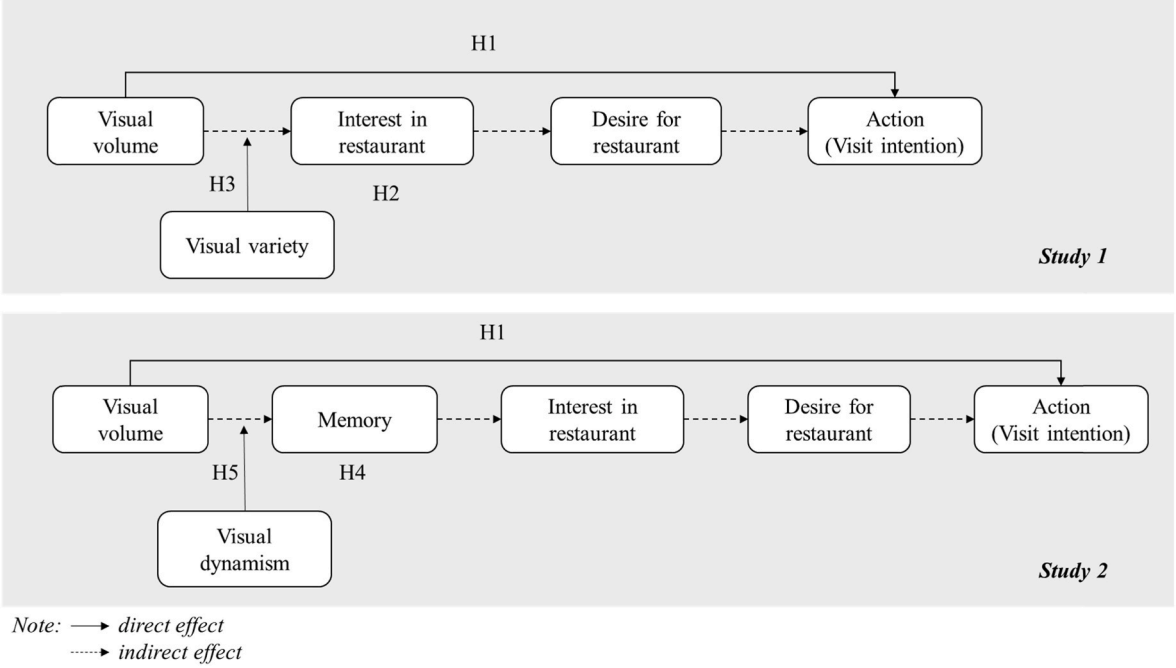

Fig. 1. Research model.

questions on the perceived visual volume and variety of the post, and their interest in, desire for, and intention to visit the restaurant. Perceived realism (Sparks & Browning, 2011) and demographic information were also collected. Attention check questions (e.g., *"How many pictures did you see in the post you just read?"*) were used to enhance data quality.

3.1.4. Participants

Two pilot tests were conducted to ensure that the manipulation worked as intended and that the stimuli, questionnaire, and procedure were clear to the participants. The main study was conducted in January and February 2022. Since most of Instagram's audience are Millennial and Gen Z users (Hootsuite, 2022b), this study's target population was online social media users aged 40 or under. Convenience sampling was used to reach and recruit users at a university in Macao. We approached participants at the university area, including at the library, cafeteria, and classrooms. Among the 171 participants with valid responses, 54.4% were female (45.6% male). Most participants were aged 20–29 (n = 94, 55%) and 30–39 (n = 41, 24%). They were mainly full-time students (n = 82, 47.9%) or working adults (n = 68, 39.8%); 53.2% earned a monthly salary of 10,000 patacas or less. They used social media to view posts more than once a day (n = 104, 60.8%), and each had more than four online social media accounts (M = 4.46, SD = 2.71).

3.2. Results

3.2.1. Manipulation check and realism

MANOVA tests showed significant main effects of visual volume ($M_{high\text{-}volume} = 5.87$ vs. $M_{low\text{-}volume} = 3.24$; $p < 0.001$) and visual variety ($M_{high\text{-}variety} = 4.61$ vs. $M_{low\text{-}variety} = 3.93$; $p < 0.001$) on their respective manipulation check items. Thus, the manipulations were considered successful. Furthermore, participants generally agreed that the experimental scenarios were realistic ($t = 11.72$, $p < 0.001$; M = 5.16, SD = 1.29).

3.2.2. Hypotheses testing

An independent *t*-test demonstrated that viewers' visit intentions were higher in the high-volume condition ($M_{high\text{-}volume} = 4.90$, SD = 1.22) than in the low-volume condition ($M_{low\text{-}volume} = 4.50$, SD = 1.14) (Mean difference = 0.39, $t = 2.17$, $p < 0.01$), thus supporting H1.

Model 6 of Preacher and Hayes's PROCESS macro (Hayes, 2018) was used to test the serial mediation effects of interest and desire on the relationship between visual volume and action. The direct effect of visual volume on visit intention was insignificant (β = 0.018, 95% confidence interval [CI] = −0.175, 0.210]). However, interest in the restaurant (β = 0.315, 95% CI = [0.178, 0.453]) and desire for the restaurant (β = 0.545, 95% CI = [0.414, 0.675]) both showed a significant relationship with visit intention. The index of serial mediation (i.e., visual volume → interest → desire → visit intention) was also significant (β = 0.199, 95% CI = [0.031, 0.384]). Thus, H2 is supported.

Model 83 was used to test the moderated serial mediation hypotheses. Model 83 is a combination of serial mediation (Model 6) and moderated mediation (Model 7). Based on our hypotheses, we used visual volume as the independent variable moderated by visual variety. The index of the moderated mediation was −0.298 (95% CI = [−0.686, −0.002]), supporting the moderating effect of visual variety on the impact of visual volume on visit intention. However, the moderating effect was inconsistent with our hypothesis. When visual variety was low, the conditional indirect effect of visual volume on action was significant (β = 0.242, 95% CI = [0.059, 0.490]), but when visual variety was high, the indirect effect was not significant (β = 0.009, 95% CI = [−0.152, 0.170]). Thus, H3 is partially supported. The results suggest that both mediation and moderation are at work and that visual volume increases visit intention through interest and desire, but only when visual variety is low.

4. Study 2

4.1. Method

Study 2 aimed to re-test H1; examine the mediating role of memory of post content on the sequential relationship among visual volume, interest, desire, and visit intention (H4); and examine the moderating effect of visual dynamism (H5). A second experiment with a 2 (visual volume: high vs. low) x 2 (visual dynamism: dynamic vs. static) between-subject design was conducted.

4.1.1. Experimental stimuli and manipulations

As in Study 1, visual volume was manipulated by altering the number of photos included in a social media post. Posts with high and low visual volume contained six and two photos, respectively. Following Cian et al. (2014) and Zhang et al. (2022), visual dynamism was manipulated using "frozen motion": Static photos contained the food products served at the restaurant, while dynamic photos captured the movement of consuming the same food products in mid-action (e.g., a person holding a fork, representing the movement of eating). To control for any confounding effects caused by differences in the angle, lighting, and visual composition of the photos, one author conducted the photoshoot at a Western restaurant in Macao. The same Instagram accounts created in Study 1 were used to upload the experimental stimuli for Study 2. Appendix I includes the screen shots of the four Instagram posts.

4.1.2. Measures

Mediating and dependent variables. Consumers' interest in, desire for, and intention to visit the restaurant after viewing the posts were measured using the same items as in Study 1. Furthermore, consumers' memory of the post content was measured using three items adapted from Wei and Lu (2013): *"I think this post is impressive," "After reading this post, I can remember it,"* and *"After reading this post, I can recall its content"* (1: strongly disagree to 7: strongly agree).

Manipulation checks. The manipulation of visual volume was verified by the same item used in Study 1. Visual dynamism was measured by participants' response to *"The photos I just saw were (1: static to 7: dynamic),"* adapted from Cian et al. (2014). Appendix II shows the measurement items of each variable and the corresponding descriptive statistics.

4.1.3. Procedure

As in Study 1, a screening question was posed before the experiment to confirm that participants were active social media users. After reading the same instructions as in Study 1, participants were presented with a smartphone displaying the Instagram posts according to their randomly assigned experimental condition. After reading the post, they responded to questions on the perceived visual volume and dynamism of the post; memory of the post content; interest in, desire for, and intention to visit the restaurant; manipulation and realism checks; and demographic profile.

4.1.4. Participants

Two pilot tests were conducted before the main study in March and April 2022. Again, Study 2's target population was online social media users aged 40 or under. Convenience sampling was used to reach and recruit this group of users at different places in Macao, such as fast food restaurants and public spaces. Of the 165 participants with valid responses, 62.4% were female (37.6% male). Most were young adults aged 20–29 years (n = 106, 64.2%). The majority were full-time students (n = 128, 77.6%); 78% earned a monthly salary of 10,000 patacas or less. Participants were frequent users of online social media and viewed posts multiple times a day (n = 100, 60.6%); each owned more than four social media accounts (M = 4.66, SD = 2.06).

4.2. Results

4.2.1. Manipulation check and realism

MANOVA tests showed significant main effects of visual volume ($M_{high\text{-}volume} = 5.50$ vs. $M_{low\text{-}volume} = 2.08$; $p < 0.001$) and visual dynamism ($M_{dynamic} = 4.93$ vs. $M_{static} = 1.64$; $p < 0.001$) on their respective manipulation check items; thus, the manipulations were successful. Participants generally agreed that the experimental scenarios were realistic ($t = 10.81$, $p < 0.001$; $M = 4.88$, $SD = 1.05$).

4.2.2. Hypotheses testing

An independent *t*-test demonstrated that visit intentions were higher in the high-volume condition ($M_{high\text{-}volume} = 4.815$, $SD = 0.99$) than in the low-volume ($M_{low\text{-}volume} = 4.377$, $SD = 1.08$) condition (Mean difference = 0.438, $t = 2.708$, $p < 0.01$), further supporting H1.

Model 6 was used to test the serial mediation effect of memory of post content, interest, and desire on the relationship between visual volume and visit intention. The direct effect of visual volume on visit intention was insignificant ($\beta = 0.140$, 95% CI = [−0.055, 0.336]). The first mediating variable, memory of post content ($\beta = 0.026$, 95% CI = [−0.72, 0.123]), was not significantly related to visit intention. However, the second and third mediating variables, interest in the restaurant ($\beta = 0.297$, 95% CI = [0.143, 0.451]) and desire to visit ($\beta = 0.467$, 95% CI = [0.341, 0.593]), both showed a significant relationship with visit intention. The index of serial mediation (i.e., visual volume → memory → interest → desire → visit intention) was significant ($\beta = 0.095$, 95% CI = [0.020, 0.199]). Thus, H4 is supported.

Model 83 was used to test the moderated serial mediation hypotheses. Based on the hypotheses, we used visual volume as the independent variable moderated by visual dynamism. The index of moderated mediation was −0.174 (95% CI = [−0.363, −0.043]), supporting the moderating role of visual dynamism in the indirect effect of visual volume on visit intention. When visual dynamism was low, the conditional indirect effect of visual volume on visit intention was significant ($\beta = 0.194$, 95% CI = [0.080, 0.352]); when visual dynamism was high, the indirect effect was not significant ($\beta = 0.020$, 95% CI = [−0.077, 0.119]). The results suggest that visual volume increases visit intention through memory of the post and interest in and desire for the restaurant, but only when visual dynamism is low. Thus, H5 is partially supported.

5. Discussion

Social media users are overwhelmed by a large amount of information provided by both businesses and previous customers. With limited cognitive resources available, consumers tend to focus on content that effectively draws their attention and arouses their interest (Simonetti & Bigne, 2022). Therefore, marketers need to design social media posts with different numbers of photos. However, taking professional photos can be time-consuming and expensive (Larceneux et al., 2018). Thus, knowledge about the interactive impact of different visual strategies can be useful for food-related businesses to design appealing food posts, leveraging the potential of VSMM.

The literature on the effect of visual volume is limited and contradictory. A key objective of this study was to verify whether "quantity prevails" in VSMM. Consistent with empirical findings regarding online reviews (Bigne et al., 2021; Hlee et al., 2019; Ma et al., 2018; Yang et al., 2017), the visual volume of a social media post was found to positively affect consumers' intention to visit the restaurant. The higher the number of photos included in a post, the higher the visit intention. One possible reason is that the inclusion of more photos in a food post allows consumers to acquire more diagnostic information about the restaurant (Larceneux et al., 2018), helping them better visualize their own experience and mitigate any uncertainty in the decision (Daft & Lengel, 1986).

This research also examined two underlying mechanisms explaining the positive effect of the visual elements of social media posts. In Study 1, interest in and desire for the restaurant sequentially mediated the relationship between visual volume and visit intention. When consumers were exposed to more photos, they became more interested in the restaurant, which induced a higher desire to visit, leading to visit intention. This supports the traditional AIDA model and the findings of previous empirical studies (Lv et al., 2022; Wei et al., 2022; Weng et al., 2021; Xu & Schrier, 2019). Study 2 underscored the significant role of consumers' memory of post content as a predecessor of their responses toward the restaurant. In line with Smith et al. (2008), consumers tried to recall the information they saw in the post before they developed an interest in, desire for, and intention to visit the restaurant. A larger number of photos encourages consumers to process the content at a deeper level, making it more memorable.

Another novel finding of this study is the interaction between visual volume and other visual strategies (i.e., visual variety and dynamism). The strategy of visual volume may be used simultaneously with other visual strategies. In line with the principles of the configuration theory, visual volume does not influence consumers in isolation but determines the outcomes of memory of post content, interest in, desire for, and action jointly with visual variety and dynamism. The two studies' findings empirically support the third principle of the configuration theory by verifying that a factor may show opposing effects depending on the context (Greckhamer et al., 2008). Contrary to the information richness theory (Daft & Lengel, 1986) and our hypothesis, Study 1 showed that visual volume and variety do not produce a multiplicative effect that enhances the effectiveness of food posts on viewers' responses. The sequential effect of visual volume on interest, desire, and visit intention was significant only when visual variety was low. This can be explained by Leung's (2021) study on the interplay between review length and breadth on the usefulness of online reviews: Lengthy, comprehensive reviews covering various aspects of hotels may lead to information overload and, thus, be perceived as less useful by readers. Similarly, a food post containing several photos showing different attributes of a restaurant may consume more cognitive effort and inhibit viewers' elaborative thinking (Rossiter & Percy, 1983). In Study 1, posts with high visual variety included three restaurant attributes (i.e., food, service, environment), while posts with low visual variety focused only on food. Since food is a restaurant's core product, food-related photos are likely to be more important than photos displaying other attributes (Leung, 2021). Though photos showing a restaurant's services and environment provide additional information, viewers may consider them less relevant to their decision. Thus, photos that focus only on food may be adequate to arouse viewers' interest in and desire to visit the restaurant.

Study 2 showed that the positive effect of visual volume on viewers' responses is contingent on visual dynamism. In particular, the sequential effect of visual volume on memory of post content, as well as interest in, desire for, and intention to visit the restaurant was significant only when visual dynamism was low. This is consistent with Zhang et al. (2022), who showed that dynamic product presentation diminished the positive effects of other visual elements such as contextual backgrounds. With a larger amount of sensory information, dynamic photos involve a higher degree of perceptual load (Macdonald & Lavie, 2011). Viewers need to spend more cognitive effort to process dynamic photos; thus, visual dynamism diverts their attention from the positive effects of visual volume.

6. Conclusions and implications

6.1. Theoretical implications

Although restaurants have increasingly adopted visual communication to achieve marketing objectives, the effect of visual volume on consumers' responses has been underexplored. This study contributes to the research on VSMM by empirically demonstrating the positive effect of visual volume and verifying the notion of "the more the better" (Bigne et al., 2021; Hlee et al., 2019; Li et al., 2022; Ma et al., 2018; Yang et al., 2017). Including more photos in a food post enhances the concreteness and diagnosticity of the information, which facilitate restaurant consumers' final decision to visit (Ryu et al., 2022). Second, this study examined the mechanism underlying the effect of visual volume. In addition to the theories and models previously used to explain the effect of social media marketing on consumer behavior, this study showed that the AIDA model can be applied to visual-based marketing to explain the relationship between visual volume and visit intention toward a restaurant. This study further extended the traditional AIDA model by adding consumers' memory of post content as a mediator between visual volume and the cognitive, affective, and conative responses toward the restaurants. This augments the existing understanding of the restaurant selection process.

Another significant contribution of the current study is the integration of the configuration theory to examine the interaction of visual volume with other visual strategies (i.e., visual variety and dynamism) on consumers' responses. Given that different visual strategies can be used simultaneously, we showed that visual volume, variety, and dynamism should be considered jointly and interactively to enhance a social media post's effectiveness. Previously it was held that when information is less accessible, using multiple visual strategies in advertising stimuli might present richer content to viewers, which helps them visualize their dining experience more easily and reduce information asymmetry in their decisions (Jeong & Choi, 2005; Liu et al., 2022; Yang et al., 2017). The current study, however, shows contrasting arguments. The simultaneous use of two visual strategies may not necessarily generate positive effects on consumers but instead create information overload. The use of visual variety or dynamism tends to complicate the information, diverting attentional resources away from and diminishing the positive effects of visual volume (Chinchanachokchai et al., 2020; Zhang et al., 2022). This finding enriches the theoretical insights on visual communication strategies for evoking positive consumer responses in the context of VSMM.

6.2. Practical implications

This study also provides practical implications for food-related businesses and influencers to strategize visual content on social media. While restaurant owners and marketers should include more photos in a single post due to the positive effect of visual volume on visit intention, the content of the photos and the way food products are presented should be carefully considered. Based on the findings regarding the interaction of visual volume, variety, and dynamism, the photos' content should contain neither too many different aspects of a restaurant (e.g., services and environment) nor any dynamic food presentations (e.g., a person holding a knife and fork), which contradicts the notion of "the more the better." In other words, if restaurant owners and marketers try to show many photos related to a restaurant, they should only include those of food products presented statically to generate more interest in, desire for, and intention to visit the restaurant. If only one photo is included in a social media post, marketers may also consider showing the restaurant's services and environment or photos depicting food consumption in motion to generate more favorable consumer responses.

When using social media as a marketing tool, restaurant owners and marketers should also pay attention to the memorability of their post content. While including more photos in a single post enhances viewers' memory of its content, other tactics that could enhance the post's memorability should also be considered to activate the interest-desire-action link. For example, existing studies on the memorability of advertisements show that using metaphors and more interesting elements can enhance viewers' memory and recall of the details of the featured brand (Beard et al., 2022; Chinchanachokchai et al., 2020).

6.3. Limitations and future research

This study has some limitations. First, only one post was shown to each participant; however, consumers often view many different posts on social media when browsing online. Future studies can enhance experimental realism by including multiple posts so that "attention" may also be measured in the AIDA model. Furthermore, other approaches, such as machine learning techniques, may be applied to analyze the effects of marketers' or influencers' different visual strategies (volume, variety, and dynamism) on consumers' instant feedback, such as user engagement with the post (e.g., number of comments, likes, and shares). Except for the visual contents, all other elements of the posts were identical in the experimental stimuli. As visual contents are often accompanied by textual contents, future research can explore the interplay between visual volume and textual characteristics, such as text length, on consumers' responses. Finally, viewers' involvement and depth of processing the post content may influence its memorability (Smith et al., 2008). Highly involved viewers may take longer going through the entire chain of effects when processing visual stimuli, while less involved viewers may skip some stages (Weng et al., 2021). Thus, future studies should consider consumers' processing style and level of involvement when exploring the effects of VSMM.

Declaration of competing interest

The authors have no conflicts of interest to declare.

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Appendix I. Experimental stimuli

Study 1

Scenario 1: Low visual volume and low visual variety

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Scenario 2: Low visual volume and high visual variety

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Scenario 3: High visual volume and low visual variety

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Scenario 4: High visual volume and high visual variety

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Study 2

Scenario 1: Low visual volume and low visual dynamism

Scenario 2: Low visual volume and high visual dynamism

(*continued on next page*)

(*continued*)

Scenario 3: High visual volume and low visual dynamism

(*continued on next page*)

(*continued*)

Scenario 4: High visual volume and high visual dynamism

(*continued on next page*)

(*continued*)


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Appendix II. Measurement items and descriptive statistics

Study 1

Variables	Items	Mean	SD	Reliability
Interest in the restaurant	1. I am interested in this restaurant. 2. I like this restaurant 3. I have a good impression of the restaurant.	4.756	1.199	0.892
Desire for the restaurant	1. I think I need to visit the restaurant. 2. I want to visit the restaurant. 3. I hope I can visit the restaurant.	4.544	1.259	0.896
Intention to visit the restaurant	1. I think the restaurant presented in the post is worth visiting. 2. I am willing to visit the restaurant. 3. I think I will enjoy dining at this restaurant.	4.686	1.194	0.841
Realism	1. I felt I could imagine myself in the scenario described above. 2. The above scenario may happen on me. 3. I think the restaurant post I have just seen was similar to those I come across on social media.	5.160	1.294	0.880
Visual volume	There are (1: very few to 7: a lot) photos available in this post.	4.500	1.793	–
Visual variety	The restaurant attributes displayed in this post are (1: very incomprehensive to 7: very comprehensive).	4.260	1.508	–

Study 2

Variables	Items	Mean	SD	Reliability
Memory of the post content	1. I think this post is impressive. 2. After reading this post, I can remember it. 3. After reading this post, I can recall its content.	4.049	1.269	0.825
Interest in the restaurant	1. I am interested in this restaurant. 2. I like this restaurant 3. I have a good impression of the restaurant.	4.562	1.047	0.864
Desire for the restaurant	1. I think I need to visit the restaurant. 2. I want to visit the restaurant. 3. I hope I can visit the restaurant.	4.303	1.206	0.906
Intention to visit the restaurant	1. I think the restaurant presented in the post is worth visiting. 2. I am willing to visit the restaurant. 3. I think I will enjoy dining at this restaurant.	4.592	1.058	0.864
Realism	1. I felt I could imagine myself in the scenario described above. 2. The above scenario may happen on me. 3. I think the restaurant post I have just seen was similar to those I come across on social media.	4.881	1.047	0.769
Visual volume	There are (1: very few to 7: a lot) photos available in this post.	3.75	1.850	–
Visual dynamism	The photos I just saw were (1: static, 7: dynamic)	3.58	1.635	–

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