**High Visual Complexity or Low Visual Complexity:**

**A study related to food advertising on Instagram**

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**Abstract**

This study examines the impact of visual complexity (V-complexity) (high/low) on consumer pleasure, arousal, and purchase intention when exposed to food advertisements on Instagram. Initially, a manipulation check was performed by getting several Instagram food advertisements rated by 100 Instagram users based on V- complexity. Later, an online questionnaire link was sent to the respondents with pictures of advertisements with high and low V-complexity. Partial least square structural equation modeling (PLS-SEM) was used on 215 usable responses with the use of the SMART-PLS software. The findings revealed that high levels of V-complexity generate arousal and pleasure and influence purchase intention. In contrast, low V-complexity doesn’t influence arousal and pleasure but affects purchase intention. This is the first study that explores the role of V-complexity in Instagram food advertising performed in a developing economy. This research also contributes to the growing body of knowledge on the V-complexity of social media food marketing.

**Keywords:** purchase intention, food advertising, Instagram, pleasure, arousal, visual complexity

**1. Introduction:**

Existing literature establishes Instagram's prominence as a widely used platform for visual content sharing, with a substantial global user base (Rogers, 2021; Lee et al., 2015; Tan, 2023). The increasing popularity of Instagram among individuals and businesses has been acknowledged, especially in the context of marketing strategies and corporate image enhancement (Iqbal, 2020; Kusumasondjaja & Tjiptono, 2019; Park & Namkung, 2022). Studies also highlight the significance of Instagram for food-related businesses, emphasizing its role in brand awareness and consumer preferences (West, 2020; Sheth, 2017; Philp et al., 2022). Furthermore, prior research suggests that effective Instagram advertising contributes to brand identification, positive attitudes, and purchase intentions (Lin et al., 2023), and aesthetically pleasing food photos can evoke positive emotions in consumers (Shah et al., 2023).

Despite the existing knowledge, there is a gap in understanding how V-complexity in Instagram advertisements influences users' decision-making processes and emotional responses. Instagram users are exposed to product and brand photos from marketers and other people, and due to information overload, people notice few visuals (Pozharliev et al., 2022). Thus, marketers strive to create advertisements that grab consumers' attention, make them stop, view their content, and most essentially, understand the message before browsing or bouncing (Rodrigue, 2022). However, the specific visual image factors that impact users' purchase decisions and the nuanced effects of V-complexity (high vs. low) on emotional responses remain unclear. It is uncertain whether visually complex advertisements effectively convey brand or product messages compared to simpler alternatives. This gap in knowledge creates an opportunity for this study to contribute valuable insights to the existing literature.

Understanding the influence of V-complexity on user behaviour in the context of Instagram advertising is crucial for marketers and businesses. With users exposed to information overload and quickly scrolling through content, capturing attention, and effectively communicating the message becomes challenging (Rodrigue, 2022). This study addresses the importance of the first impression made by an Instagram advertisement and explores how V-complexity impacts users' likelihood of processing the message effectively. Specifically, this study addresses two essential inquiries: What are the visual image factors that influence a user's decision to make a purchase? How does the V-complexity of an Instagram post (high vs. low) affect the emotional response of the viewer? The study employed an experimental approach to investigate these concerns by showing participants food advertisements on Instagram with varying degrees of V-complexity.

The value of this paper lies in its theoretical contribution to the understanding of V-complexity in the realm of Instagram advertising. By investigating how users perceive and process brand or product messages with varying V-complexity, the study expands theoretical knowledge in the field. Managerially, the findings provide actionable insights for businesses, particularly in the food industry, helping them optimize their Instagram advertising strategies for enhanced consumer engagement and response. This study enriches theoretical understanding in social media marketing, advertising, and food photography. It advances the link between V-complexity and consumer behavior on Instagram, offering insights into pleasure, arousal, and purchase intention (Czarnecka & Mogaji, 2020; Lazard et al., 2018). The practical insights derived from this research hold significant value for various stakeholders. Food businesses and marketers, in particular, can capitalize on these findings to tactically craft visually intricate food photographs for Instagram. This strategic approach aims to enhance consumer pleasure, arousal, and ultimately drive purchase intention.

The paper is structured as follows. Section 2 discusses the literature and hypotheses. Section 3 provides the details of the methodology that leads to results of the study presented in section 4. Lastly, section 5 provides a conclusion and implications.

**2. Literature review and hypothesis development:**



***2.1. Social Media Advertising***

The term "social media" refers to a broad category of Internet-based tools for fostering interpersonal communication and sharing user-generated content (Valkenburg, 2022; Aslam et al., 2022; Dubey & Sinha, 2023). Advertisers and marketers are always experimenting with social media integration to boost brand digital engagement (Voorveld et al., 2018; Sohaib & Han, 2023; Linardi et al., 2023). Many companies are extensively using social media marketing, and with the use of data like likes, number of shares, comments, views, follower count, total clicks, marketers can easily receive first-hand insights into client preferences (Domínguez-Navarro & González-Rodríguez, 2020). From a commercial perspective, customers and brands can use various social media channels, and each social networking platform differs in identification, sharing, discussions, presence, reputation, relationships, and groups (Pelletier et al., 2020). Additionally, brands advertise differently on different social media networks. Instagram, an image-sharing platform, supports visually appealing advertisements, so companies focus on them (Newberry, 2016). The advertising visuals, timings, and various occasions have a major impact on advertising performance. Thus, when advertising the brand on social media, a marketer must rigorously assess all aspects to elicit the appropriate response from the target demographic (Kusumasondjaja & Tjiptono, 2019).

***2.2. Visual Complexity (V-complexity)***

Just like with all other senses, visual perception is formed with various elements, such as color, contrast, and arrangement of objects (Sample et al., 2020). V-complexity theory states that all visuals have some redundancy, but those with more redundancy are visually complex (King et al., 2020). The true essence of advertising lies in gathering consumers’ attention towards the brand and that is what is achieved with the right usage of V-complexity (Pieters et al., 2010; Overgoor et al., 2022). Despite the rich literature available on V-complexity, there is no joint agreement on whether an advertisement should adopt V-complexity or go with a simple design approach (Sokolova, 2021). In some studies, V-complexity is found captivating near the consumers because it makes the advertisement visually hard to comprehend, thus making them stay longer and focus on the advertisement (Kusumasondjaja & Tjiptono, 2019).

In a visually complex design, it may be easier to provide plenty of vital information, than with a simple design approach which may be easy on the consumers’ cognitive capabilities to process the provided information (Wu et al., 2016). Studies suggest that designs with high V-complexity bring more engagement (Tong et al., 2022) and get higher likability (King et al., 2020). Some studies suggest that the simplicity of visuals is key to success in marketing products that require interaction (Eytam et al., 2017). When it comes to psychology, Gestalt theory sets simplicity as the most important element of visual design (Post et al., 2023). Unnecessary features in visuals may cause fatigue in end consumers (Souchet et al., 2022) and simple advertisements work better towards creating desired impacts (Pandir & Knight, 2006). However, some suggest visually complex advertisements perform better in terms of desired consumer response (Geissler et al., 2006; King et al., 2020; Pieters et al., 2010). The literature shows mixed results and urges the researchers to analyze whether low or high V-complexity is better for food advertisement.

Literature claimed that V-complexity in advertisement led to high levels of arousal and pleasure in consumers when they are browsing a social media platform (Madan et al., 2018; Kusumasondjaja & Tjiptono, 2019; Tong et al., 2022), and affect purchase intention (Tong et al., 2022). Pleasure and arousal are widely recognized as prominent feelings in several research investigating the stimulation of food (e.g., Kusumasondjaja & Tjiptono, 2019; Racine, 2018), and these two categories serve as indicators for consumer reactions (Kusumasondjaja & Tjiptono, 2019). The stimulus-organism-response (SOR) theory (Mehrabian & Russell, 1974) also emphasized that environmental stimuli (i.e., Instagram advertisement) bring positive emotions (pleasure and arousal) that affect response (purchase intention). Therefore, following are the hypotheses:

*H1. High* V-complexity *food advertising on Instagram significantly (a) brings pleasure to consumers (b) arouses consumers (c) affects purchase intention.*

*H2. Low* V-complexity *food advertising on Instagram significantly (a) brings pleasure to consumers (b) arouses consumers (c) affects purchase intention.*

***2.3. Consumer Arousal and Pleasure***

Arousal and pleasure are the two most foundational parameters of emotional experiences (Kusumasondjaja & Tjiptono, 2019). Pleasure refers to a state in which consumers feel “pleased, good, happy, satisfied, and joyful” (Tong et al., 2022) whereas arousal is the “extent to which an individual feels stimulated, excited, alert, or active” (Holmqvist & Lunardo, 2015). The theory SOR suggests that environmental stimulus acts as a trigger for behavioral responses through the consumer’s emotional states such as arousal and pleasure (Mehrabian & Russell, 1974; Aslam & Luna, 2021). Numerous studies reveal the significance of pleasure and arousal in customer responses to advertising (Belanche et al., 2017; Kusumasondjaja & Tjiptono, 2019; Rita et al., 2023). The studies also reported that pleasure and arousal developed through advertising leads to purchase intention (Kusumasondjaja & Tjiptono, 2019; Zhang et al., 2023; Laroche et al., 2022). In the context of online shopping, vibrant and flashy advertisements mostly generate high levels of arousal and pleasure, making the shopping decision-making process easy and quick (Laroche et al., 2022). Similarly, pleasure derived from advertising is found to be successful in predicting purchase intentions in the online shopping context (Fernandes et al., 2020). Therefore, we can say:

*H3. If V-complexity is higher in Instagram food advertising (a) consumer pleasure has a significant impact on consumer purchase intention (b) arousal has a significant impact on consumer purchase intention.*

*H4. If V-complexity is lower in Instagram food advertising (a) consumer pleasure has a significant impact on consumer purchase intention (b) arousal has a significant impact on consumer purchase intention.*

*H5. Pleasure mediates the relationship between (a) high V-complexity of food advertising in Instagram and consumer purchase intention (b) low V-complexity of food advertising in Instagram and consumer purchase intention.*

*H6. Arousal mediates the relationship between (a) high V-complexity of food advertising in Instagram and consumer purchase intention (b) low V-complexity of food advertising in Instagram and consumer purchase intention.*

Figure 1 presents the research model of the study developed based on SOR theory.

Stimulus

Organism

Response

Figure 1- Model

**3. Methods**

***3.1 Stimuli development***

The study used an experimental design. Participants were exposed to printed versions of Instagram food adverts with high and low V-complexity. The study aims to measure the role of high and low V-complexity of Instagram food advertising on developing arousal, pleasure, and purchase intention. Therefore, this study used Instagram food advertising as a stimulus, following previous advertising experimental studies (McCormick, 2016; Phua et al., 2017, Russell & Rasolofoarison, 2017; Phua et al., 2018). Experimental research favors real advertising over mock advertising for ecological validity and participant responses (Mitchell, 1986). The study picked four food advertisements with the highest likes and comments and assessed their complexity. The complexity level was measured using Pieters et al., (2010) criteria. Each shortlisted photo was graded 1–4 on all items, with 1 being “the least” and 4 being “the most.” The photographs that received the highest and lowest scores were chosen and subsequently utilized for the experiment. As a consequence of this procedure, two photographs were obtained, one depicting food with a high degree of complexity, while the other exhibited a comparatively lower level of complexity.

***3.2 Manipulation check:***

To select the right images for the main study, a manipulation check was done on a sample of 100 people. The sample consisted of 59 males and 41 females, 25 years in age on average. This whole activity was performed in a classroom setting of a private university. Consent was taken from the teacher for the whole activity and students were given the chance not to participate. Participants were exposed to various stimuli to measure the V-complexity of 4 Instagram advertisements. Levels of V-complexity was measured based on six dimensions proposed by Pieters et al., (2010) like the number of objects, irregularity, variation in the visuals, detail in the visuals, the level of asymmetric arrangement in the visual, and arrangement irregularity. The participants were shown the images, and this whole activity was performed in multiple computer lab classes where images were shown on computer screens and the students were briefed to rate each image from 1 to 4 depending upon the characteristics mentioned above. After the whole activity, 2 images were selected for the main study, 1 with the least score, and 1 with the highest score of V-complexity.

Figure 2 is the image that was rated high as a visually complex image, and Figure 3 is the image that was rated low as a visually complex image.

A group of food in containers

Description automatically generated

Figure 2- High Visually Complex Image

A person holding a sandwich

Description automatically generated

Figure 3- Low Visually Complex Image

***3.3 Research instruments***

The questionnaire was used as a data collection tool. There were two parts to the questionnaire. The first one consisted of basic questions in which respondents were supposed to provide information about demographics such as age, gender, and income. In the second part, the main stimuli with questions that measure the participants’ level of arousal and pleasure derived from the stimuli leading to purchase intention. The constructs were rated on 7 points Likert scale in which 7=Strongly Agree, and 1=Strongly Disagree. Items for pleasure and arousal were adapted from Kaltcheva and Weitz (2006) and the items of purchase intention were adapted from Aghekan-Simonian et al., (2012). The items of each construct are mentioned in Appendix A.

***3.4 Procedures and*** ***Participants:***

Data was gathered through a purposive sampling technique from the Instagram users of Pakistan. The link of the online questionnaire was posted on Instagram and sent to friends, family, and colleagues through Whatsapp. In the beginning, we added a filter question to validate if the person is a user of Instagram. Only those who verified that they had been active Instagram users for a minimum of a year were asked to reply to the survey. In total, 235 responses were gathered on which data screening was performed. The missing values were replaced by series mean value and outliers were detected and deleted by using z-score and Mahalanobis distance method that reduced the data to 215. The exclusion of responses formed an integral part of a meticulous data cleaning procedure aimed at fortifying the dataset's quality. By systematically eliminating outliers, errors, and incomplete submissions, the process sought to mitigate any factors that might have distorted the study's results. Moreover, this curation was undertaken to safeguard the integrity of the data, with a primary focus on augmenting the precision of the study's findings. The remaining sample of 215 exceeds the minimum sample requirement of 137 for the study, calculated by Daniel Soper sample calculator (Daniel Soper, 2023). Table I presents the details of the respondents. Moreover, common method bias (CMB) was also assessed on useful sample to ensure the absence of multicollinearity. The values of variance inflation factor (VIF) of the variables were found below 3.30, and hence confirms that there are no potential biases in the data.

|  |  |  |
| --- | --- | --- |
| **Table I - Demographic Profile** | | |
|  | **Frequency** | **%** |
| **Gender** |  |  |
| Male | 104 | 48.37 |
| Female | 111 | 51.63 |
| **Age** |  |  |
| 18-21 | 47 | 21.86 |
| 22-26 | 154 | 71.63 |
| 27 & above | 14 | 6.51 |
| **Education Level** |  |  |
| Under-graduate | 52 | 5.22 |
| Graduate | 143 | 53.36 |
| Post-graduate | 93 | 34.7 |
| **Income (PKR)** |  |  |
| Below Rs.10,000 | 38 | 17.67 |
| Rs.10,000-15,000 | 28 | 13.02 |
| Rs.15,001-20,000 | 52 | 24.19 |
| Rs.20,001-25000 | 45 | 20.93 |
| Rs.25,001 & above | 52 | 24.19 |

**4. Results**

**4.1 Measurement Model Assessment**

Following the guidelines of the Hair Jr et al., (2016), the first indicator reliability was assessed by outer loadings (OL). It is recommended that the OL should be above 0.708, therefore the items that have OL below 0.708 were excluded from the analysis. In the second step, construct reliability was assessed that measures the internal consistency of the items. The reliability is considered adequate if the value of Cronbach alpha (CA) and composite reliability (CR) is found above 0.700 (Hair Jr et al., 2016). In the third step, convergent validity was assessed. For the establishment of convergent validity, it is required that the values of average variance extracted (AVE) should be higher than 0.5 (Hair Jr et al., 2016) and outer loading should be above 0.708. Table II confirms that all the values of OL, internal consistency, and convergent validity are meeting the suggested threshold.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table II- Outer Loadings** | | | | | | | | | |
| **Items** | **OL (HVC)** | **OL (LVC)** | **CA (HVC)** | **CA**  **(LVC)** | **CR (HVC)** | **CR (LVC)** | **AVE (HVC)** | **AVE (LVC)** | **Sources** |
|  |
| ***Pleasure (P)*** | | | | | | | | | |  |
| P1 | 0.906 | 0.862 | 0.876 | 0.895 | 0.923 | 0.923 | 0.801 | 0.706 | Kaltcheva and Weitz (2006) |  |
| P2 | 0.909 | 0.838 |  |
| P3 | Deleted | 0.784 |  |
| P4 | Deleted | 0.88 |  |
| P5 | 0.869 | 0.834 |  |
| ***Arousal (A)*** | | | | | | | | | |  |
| A1 | 0.869 | 0.854 | 0.831 | 0.867 | 0.899 | 0.909 | 0.747 | 0.714 | Kaltcheva and Weitz (2006) |  |
| A2 | 0.87 | 0.815 |  |
| A3 | Deleted | 0.852 |  |
| A4 | 0.853 | 0.859 |  |
| ***Purchase Intention (PI)*** | | | | | | | | | |  |
| PI1 | Deleted | 0.870 | 0.860 | 0.910 | 0.905 | 0.933 | 0.704 | 0.736 |  |  |
| PI2 | 0.868 | 0.871 | Aghekyan-Simonian et al., (2012) |  |
| PI3 | 0.81 | 0.841 |  |
| PI4 | 0.842 | 0.891 |  |
| PI5 | 0.836 | 0.815 |  |
| Note: HVC = High Visual Complexity, LVC= Low Visual Complexity | | | | | | | | | |  |

Fourth, discriminant validity was checked to assess the degree to which a single variable is empirically different from the other variable (Hair Jr et al., 2016) by using Fornell and Larcker (1981) criterion, Heterotrait Monotrait Ratio (HTMT), and cross-loadings. According to Fornell and Larcker criteria, the square root of AVE of each variable should be more than the correlation values of other variables present in corresponding rows and columns (Hair Jr et al., 2016). Table III reports the results of Fornell and Larcker criteria for both high and low V-complexity, and established discriminant validity.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table III-Fornell-Larcker Criterion** | | | |
| **HVC** | | | |
|  | **Arousal** | **Pleasure** | **Purchase Intention** |
| **Arousal** | **0.864** |  |  |
| **Pleasure** | 0.764 | **0.895** |  |
| **Purchase Intention** | 0.76 | 0.735 | **0.839** |
| **LVC** | | | |
| **Arousal** | **0.845** |  |  |
| **Pleasure** | 0.757 | **0.840** |  |
| **Purchase Intention** | 0.8 | 0.775 | **0.858** |

Another technique to assess discriminant validity is HTMT (Heterotrait -Monotrait Ratio) recommended that HTMT values should be less than 0.9 (Henseler et al., 2016). The results in table IV revealed that all the values have met the cut-off value for both high and low V-complexity.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table IV- HTMT** | | | |
| **HVC** | | | |
|  | **Arousal** | **Pleasure** | **Purchase Intention** |
| **Arousal** |  |  |  |
| **Pleasure** | 0.895 |  |  |
| **Purchase Intention** | 0.896 | 0.844 |  |
| **LVC** | | | |
| **Arousal** |  |  |  |
| **Pleasure** | 0.091 |  |  |
| **Purchase Intention** | 0.858 | 0.118 |  |

The last method to assess discriminant validity is cross-loadings suggest that all the loadings of every item of each variable must be the highest in its respective variable as compared to its loadings in other variables (Hair Jr et al., 2016). Table V presents the results of cross-loadings and established discriminant validity.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Table V-Cross Loadings** | | | | | | |
|  | **HVC** | | | **LVC** | | |
|  | **Arousal** | **Pleasure** | **Purchase** | **Arousal** | **Pleasure** | **Purchase Intention** |
| **Intention** |
| **A1** | **0.869** | 0.67 | 0.63 | **0.854** | 0.623 | 0.645 |
| **A2** | **0.87** | 0.709 | 0.676 | **0.815** | 0.665 | 0.659 |
| **A3** | **0.853** | 0.599 | 0.662 | **0.852** | 0.66 | 0.705 |
| **A4** | **Del** | Del | Del | **0.859** | 0.61 | 0.694 |
| **P1** | **Del** | **Del** | Del | 0.607 | **0.784** | 0.647 |
| **P2** | 0.691 | **0.906** | 0.679 | 0.601 | **0.862** | 0.625 |
| **P3** | Del | **Del** | Del | 0.671 | **0.88** | 0.703 |
| **P4** | 0.68 | **0.909** | 0.676 | 0.609 | **0.838** | 0.608 |
| **P5** | 0.68 | **0.869** | 0.616 | 0.683 | **0.834** | 0.663 |
| **PI1** | Del | Del | **Del** | 0.748 | 0.686 | **0.87** |
| **PI2** | 0.707 | 0.688 | **0.868** | 0.701 | 0.702 | **0.871** |
| **PI3** | 0.637 | 0.552 | **0.81** | 0.68 | 0.615 | **0.841** |
| **PI4** | 0.612 | 0.579 | **0.842** | 0.68 | 0.681 | **0.891** |
| **PI5** | 0.587 | 0.64 | **0.836** | 0.619 | 0.635 | **0.815** |

**4.2 Structural Model**

To evaluate hypotheses, the technique of bootstrapping was employed on 5000 subsamples, as suggested by Hair Jr et al. (2016). Table VI presents the results for both high and low V-complexity. Findings show that high V-complexity of the advertising significantly affect pleasure (coefficient = 0.49, p < 0.05), arousal (coefficient = 0.59, p < 0.05) and purchase intention (coefficient = 0.13, p < 0.05). Hence, H1a, H1b, and H1c are accepted. Also, in case of high V-complexity advertising, pleasure (coefficient = 0.36, p < 0.05) and arousal (coefficient = 0.40, p < 0.05) both significantly affect purchase intention. Hence, H3a and H3b are accepted. Figure 4 also shows the finding for high V-complexity.

0.490 \*\*

0.590 \*\*

0.130 \*\*

0.360 \*\*

0.400 \*\*

Note: \*\* = p < 0.05

Figure 4- Results of High Visual Complexity

The study also revealed that low V-complexity doesn’t have any impact on arousal (coefficient = 0.08, p > 0.05) and pleasure (coefficient = 0.11, p > 0.05) but it affects purchase intention (coefficient = 0.10, p < 0.05). Hence, H2a and H2b are rejected and H2c is accepted. However, in case of low V-complexity both, pleasure (coefficient = 0.38, p < 0.05) and arousal (coefficient = 0.50, p < 0.05) significantly affect purchase intention of the consumer. Hence, H5 and H6 are accepted. Figure 5 shows the finding for low V-complexity.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Table VI - Hypotheses Testing** | | | | |
|  | **Path** | **Beta** | **T-Stats** | **P Values** |
| H1a | High Visual Complexity -> Pleasure | 0.490 | 8.26 | 0.00 |
| H1b | High Visual Complexity -> Arousal | 0.590 | 10.44 | 0.00 |
| H1c | High Visual Complexity -> Purchase Intention | 0.130 | 2.14 | 0.032 |
| H2a | Low Visual Complexity -> Pleasure | 0.110 | 1.85 | 0.065 |
| H2b | Low Visual Complexity -> Arousal | 0.080 | 1.19 | 0.234 |
| H2c | Low Visual Complexity -> Purchase Intention | 0.100 | 2.5 | 0.013 |
| H3a | Pleasure -> Purchase Intention | 0.360 | 4.91 | 0.00 |
| H3b | Arousal -> Purchase Intention | 0.400 | 5.16 | 0.00 |
| H4a | Pleasure -> Purchase Intention | 0.380 | 6.61 | 0.00 |
| H4b | Arousal -> Purchase Intention | 0.500 | 8.73 | 0.00 |

0.110 ns

0.080 ns

0.100 \*\*

0.380 \*\*

0.500 \*\*

Note: \*\* = p < 0.05, ns = not significant

Figure 5- Results of High Visual Complexity

The R-square and Q- square values are also determined. In the case of high V-complexity advertising, the values of R – square for pleasure, arousal and purchase intention were found 23.8%, 35.4%, and 64.6% respectively, whereas for low V-complexity, R-Square values of pleasure, arousal, and purchase intention were found 1.1%, 0.6% and 71.3%, respectively. Moreover, for high V-complexity and low V-complexity, the value of Q-square for purchase intention was found 0.444 and 0.521, respectively.

**4.4 Mediation Analysis**

For a better view of the findings, mediation effects were also checked. It is found that pleasure (coefficient = 0.18, P-value < 0.05) and arousal (coefficient = 0.24, P-value < 0.05) both mediates the relationship in between high V-complexity and purchase intention. Hence, H5a and H6a are accepted. However, pleasure (coefficient = 0.04, P-value > 0.05) and arousal (coefficient = 0.04, P-value > 0.05) doesn’t mediate in between low V-complexity and purchase intention. Hence, H5b and H6b are rejected.

|  |  |  |  |
| --- | --- | --- | --- |
| **Table VII- Mediation Analysis** | | | |
|  | **Path** | **Beta** | **P Values** |
| H5a | High Visual Complexity -> Pleasure -> Purchase Intention | 0.18 | 0.00 |
| H5b | Low Visual Complexity -> Pleasure -> Purchase Intention | 0.04 | 0.086 |
| H6a | High Visual Complexity -> Arousal -> Purchase Intention | 0.24 | 0.00 |
| H6b | Low Visual Complexity -> Arousal -> Purchase Intention | 0.04 | 0.259 |

**5. Discussion**



The primary objective of this research was to examine the impact of food advertising on Instagram concerning high and low levels of V-complexity on pleasure, arousal, and purchase intention. The contemporary perspective on food photography prioritizes fundamental factors such as composition, lighting, and shadows over the emphasis on equipment types (Dujardin, 2011). This shift in focus opens new possibilities for engaging cellphone-shot pictures, making the findings relevant for various small-sized food businesses. Photo manipulation at the postproduction stage is a common procedure for tweaking V-complexity, with significant impacts on audience attitudes in the context of food advertisements (Lazard et al., 2018).

The research findings highlight that advertisements with high V-complexity significantly impact pleasure and arousal, aligning with previous studies that demonstrated more favorable responses to high V-complexity (Kusumasondjaja & Tjiptono, 2019; Mai et al., 2014). Food photography, distinguished by critical elements such as composition and lighting, underscores the importance of the right V-complexity for likable food photographs, evoking emotions like warmth, nostalgia, and desire (Campbell, 2012; Young, 2015). V-complexity, by capturing attention and requiring more focus from customers, becomes essential for creating effective food advertisements. Consumer behavior towards advertisements is shaped significantly by high V-complexity (Tuch et al., 2009).

In the complex environment of social media, V-complexity plays a crucial role in achieving the desired response time for marketers to succeed (Tuten, 2020). Reversal theory suggests that consumer reactions to advertisements are influenced by the context, associating environmental cues with either anxiety or excitement (Lafreniere, 1993). Consumers are more likely to experience enjoyment with ads in a paratelic situation and anxiety when ads interfere with a telic situation. The study extends the impact of design elements beyond images, emphasizing their significance in the physical store environment, particularly for the retail industry (Van Rompay et al., 2012). High V-complexity is shown to increase overall appeal, influencing consumer psychology, pleasure, and arousal, especially when consumers are in a paratelic state seeking fun and pleasure (Jang et al., 2018). Considering these findings, high V-complexity is deemed most effective in food advertisements, particularly on social media platforms like Instagram, where users are in a paratelic state or seeking social needs, content creation, and self-expression (Lee et al., 2015).

***5.1. Theoretical implications:***

This study makes several theoretical contributions to social media marketing, advertising and food photography. Firstly, the study provides theoretical insight into V-complexity and consumer behaviour. The study significantly contributes to the understanding of how V-complexity in advertisements (Czarnecka & Mogaji, 2020; Sohaib & Han, 2023; Voorveld et al., 2018), specifically in the context of food marketing on Instagram, influences consumer behaviour (McCormick, 2016; Phua et al., 2017, Russell & Rasolofoarison, 2017; Phua et al., 2018). By linking V-complexity to pleasure, arousal, and purchase intention, the research adds valuable insights to the theoretical framework of consumer responses to visual stimuli in the digital advertising landscape (Lazard et al., 2018; Pieters et al., 2010).

Furthermore, this study provides valuable insights into the practical use of Reversal Theory within the field of advertising (Lafreniere, 1993; Van Rompay et al., 2012; Jang et al., 2018). The incorporation and utilization of reversal theory within the discourse offers a theoretical framework through which to comprehend how individuals link environmental stimuli with affective states, such as feelings of dread or joy. This research contributes to the wider domain of advertising psychology by presenting a theoretical framework for understanding consumer responses to advertisements in relation to their psychological states (Lee et al., 2015; Jang et al., 2018; Mogaji, et al, 2018). Furthermore, the present study expands upon the theoretical framework proposed by Mehrabian and Russell, known as the Stimulus-Organism-Response (S-O-R) theory (Aslam & Luna, 2021; Mehrabian & Russell, 1974), examining the impact of varying levels of V-complexity on individuals' pleasure, arousal, and purchase intention (Overgoor et al., 2022; Sokolova, 2021). This theoretical positioning enhances the understanding of the interplay between visual elements and consumer responses in the online advertising environment.

Third, the study integrates the concept of V-complexity into the context of online shopping (Kusumasondjaja & Tjiptono, 2019; Wu et al., 2016; Tong et al., 2022; Gökerik et al, 2018), specifically in food photography (Abril et al., 2022; Cavazza et al, 2020; Walsh, & Baker, 2020), emphasizing its impact on perceived arousal and pleasure. By establishing the relevance of V-complexity in the social media environment and beyond product photography (King et al., 2020; Eytam et al., 2017; Post et al., 2023; Souchet et al., 2022); the research provides theoretical insights that marketers can apply to optimize their advertising strategies on platforms like Instagram (Abril et al., 2022; Cavazza et al, 2020; Walsh, & Baker, 2020). Findings from this study offer a theoretical foundation for marketers and researchers seeking to understand and leverage the psychological aspects of V-complexity in the digital marketing landscape.

***5.2. Managerial implications***

The managerial implications of this research are valuable for a diverse range of stakeholders. Primarily, food businesses and marketers can leverage these insights to strategically design visually complex food photographs for Instagram, optimizing consumer pleasure, arousal, and purchase intention. Furthermore, online retailers operating in diverse sectors can derive advantages by modifying the V-complexity to suit the aesthetics of their respective platforms and products. This knowledge may be used by social media managers, photographers, and creative professionals to improve the visual content they publish and ensure it effectively grabs the attention of the audience.

Marketers and food businesses should design their Instagram food photographs deliberately, taking into account the level of visual intricacy. According to the study's findings, high levels of V-complexity have a beneficial impact on customer pleasure and arousal, resulting in higher purchase intention. Food companies can concentrate on creating visually complex visuals by varying composition aspects such as the quantity of objects, the number of distinct objects, and the positioning of objects. This can be accomplished by carefully planning and executing food photography in order to provoke a good emotional response from customers.

Managers must also use emotional appeal in their marketing initiatives (Aslam et al., 2021). The study stresses that high V-complexity induces consumer enjoyment and excitement, which favorably influences purchase intention. Marketers can capitalize on this understanding by infusing emotional appeal into their Instagram food marketing. Food companies may integrate their marketing activities to provide visually complex visuals that elicit joy, excitement, and stimulation. The inclusion of emotional aspects in commercials has the potential to augment the overall attractiveness and heighten the probability of customers manifesting purchase intention.

Additionally, Managers can adapt V-complexity for different products and platforms. The present study suggests that understanding V-complexity is crucial not only for food businesses but for all online shopping businesses. Moreover, V-complexity can capture attention on social media platforms. Marketers should adapt the level of V-complexity based on the nature of the product and the platform where the advertisement will be displayed. For food businesses, the complexity can be tailored to evoke the desired emotional response on Instagram. Similarly, the knowledge of V-complexity can be applied to other products when advertising online, considering the specific characteristics of each platform and target audience.

In considering alternative or competing perspectives within the realm of food photography on Instagram, it's imperative to acknowledge the cultural and social dimensions that shape consumer responses. While the study emphasizes the positive impact of high V-complexity on consumer pleasure and arousal, it's crucial for marketers and food businesses to be cognizant of diverse cultural and social contexts. Different communities may interpret V-complexity in varied ways, influencing their emotional responses. Therefore, a nuanced approach that aligns V-complexity with the cultural preferences and social nuances of specific target audiences becomes paramount. This awareness fosters a more inclusive and effective strategy, ensuring that visually complex food photographs resonate authentically across diverse cultural landscapes on Instagram.

**6. Conclusion**

***6.1. Concluding Remarks and Summary:***

In conclusion, this research sheds light on the intricate dynamics of food advertising on Instagram, particularly concerning the impact of varying levels of V-complexity on consumer responses. Emphasizing composition and lighting over equipment, the study underscores the pivotal role of high V-complexity in influencing pleasure and arousal, aligning with prior research affirming the effectiveness of complex visuals. The relevance of V-complexity extends to food photography, contributing to the creation of emotionally resonant and likable food images. The study provides practical insights for marketers, emphasizing the significance of crafting visually complex food advertisements to capture attention and generate consumer interest in the competitive landscape of social media.

***6.2. Research Limitations:***

While the study offers valuable insights, it is essential to acknowledge its limitations. The use of student participants, while moderately representative of Instagram users, raises concerns about the generalizability of findings. Pre-established stimuli may have altered participants' feeling of reality, therefore future studies could use more immersive settings or Instagram users interested in food content. Enhancing external validity could be achieved by expanding the sample size and extending the research context outside the confines of Pakistan. Additionally, exploring the efficacy of high vs low V-complexity across diverse product categories could deepen our understanding. Addressing these limitations in future research will contribute to a more comprehensive understanding of consumer responses in the social media advertising landscape.

***6.3. Agenda for Future Research:***

Moving forward, several avenues for future research emerge from this study. First, research into the links between consumers' pleasure, arousal, and intent to buy across a wide range of goods (e.g., smartphones, automobiles, FMCG) using the same research design could unveil nuanced insights. Studies of social media advertising might benefit from the addition of three tiers of V-complexity (low, medium, and high) to better understand users' preferences. Examining Instagram data like "likes" and comments may help provide light on the connection between consumer satisfaction and excitement. Furthermore, it is recommended that future research endeavors focus on exploring the influence of situational variables in moderating consumer evaluations on social media platforms. Understanding how situational factors influence consumer decisions and choices in the context of social media advertising remains a crucial area for exploration. In conclusion, the future research agenda should aim to enhance the applicability and generalizability of findings, providing a more comprehensive understanding of consumer behaviour in the evolving landscape of digital advertising.

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**Appendix A**

**Pleasure (Source:** Kaltcheva & Weitz 2006)

|  |
| --- |
| “The advertisements make me happy.” |
| “The advertisements are relaxing.” |
| “The advertisements are pleasing.” |
| “The advertisements satisfy me.” |
| “The advertisements make me contented.” |

**Arousal (Source:** Kaltcheva & Weitz 2006)

|  |
| --- |
| “The advertisements make me stimulated” |
| “The advertisements are sensational” |
| “The advertisements excite me.” |
| “The advertisements make me aroused.” |

**Purchase Intention (Source:** Aghekyan-Simonian et al., (2012))

|  |
| --- |
| “After viewing the advertisements, I became interested in making a purchase.” |
| “After viewing the advertisements, I am willing to purchase the product being advertised.” |
| “After viewing the advertisements, I would consider purchasing the advertised product.” |
| “After viewing the advertisements, I will probably purchase the product being advertised.” |
| “After viewing the advertisements, it is very likely that I will buy the product being advertised.” |