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Is Slow Motion Necessary? A Study on the Impact of Brand Advertising Presentation Speed on Consumer Brand Attitude

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Abstract: ***In the era of big data, individuals are inundated with a substantial amount of information daily. The explosive growth of information juxtaposed with limited attention spans creates a contradiction, making it imperative for businesses to attract and capture consumer attention to gain competitive advantage. Video advertisements enhance the comprehensive presentation of product information by incorporating various visual and textual elements. However, when the amount of information exceeds consumers' capacity for effective processing, it may diminish consumers' brand attitudes. Slow-motion techniques elongate the duration of specific actions, thereby reducing the volume of information consumers receive per unit of time and lowering cognitive load. This reduction in cognitive load potentially enhances consumers' attitudes towards advertised brands. Thus, the following hypotheses are proposed: H1: Slow-motion advertisements can enhance consumers' brand attitudes; H2: Cognitive load mediates the effect of slow-motion advertisements on brand attitudes; H3: Cognitive focus moderates the effect of slow-motion advertisements on consumer brand attitudes; H3a: For consumers focused on the process, slow-motion enhances brand attitudes; H3b: For consumers focused on outcomes, the effect of slow-motion on brand attitudes is less pronounced.***

Keywords: Slow-motion, Cognitive load, Focused thinking, Brand attitude**.**

1. Introduction

With the rapid evolution of technology and the internet, video marketing has emerged as a predominant form of advertising. Increasingly, businesses are opting to employ video advertisements to captivate consumers and achieve their promotional objectives [1]. Studies indicate that video advertising holds substantial sway over consumer decision-making processes, positioning it as the premier advertising medium in the digital age [2]. Video ads encompass two primary components: static textual elements and dynamic visual imagery, rendering them more adept at capturing consumer attention compared to alternative advertising formats [3]. Nonetheless, video advertising exhibits inherent limitations, notably its capacity to convey information limited solely to visual (video) and auditory (audio) cues. To augment non-visual (auditory) information, recent advancements in video advertising include incorporating demonstrations or consumer reactions, such as smiling while chewing food or luxuriating in a leisurely shower. These strategies serve to validate product utility socially, thereby fostering consumer perceptions of product efficacy [4].

Enhancing the non-visual (auditory) attributes of a brand in video marketing can be effectively achieved by manipulating the playback speed of videos. This technique involves either slowing down (slow motion) or speeding up (time-lapse) the visual sequences in comparison to real-life speeds. Incorporating slow-motion effects in advertisements serves the purpose of highlighting specific product functionalities to consumers [5]. In luxury product video advertisements, the use of slow-motion can enhance the perception of product extravagance [6]. Moreover, compared to fast-paced video presentations, slow-motion videos contribute to enhancing the overall allure of websites [7]. This distinction arises because fast-paced videos emphasize the holistic aspects, whereas slow-motion presentations accentuate finer details [8,9]. Consequently, it can be inferred that viewers engage with different levels of information when exposed to videos presented at varying speeds. Fast-paced video ads attract attention to overall impressions, while slow-motion ads facilitate a deeper understanding of detailed information by consumers.

Therefore, this study aims to investigate whether incorporating slow-motion videos in advertisements enhances consumers' positive evaluations of the brand. Specifically, the study seeks to address the following questions: first, the impact of slow-motion on brand attitudes within advertisements; second, the mediating mechanisms through which slow-motion affects brand attitudes in advertisements; and third, the boundary conditions under which slow-motion influences brand attitudes in advertisements.

2. Theoretical Background

2.1 Current Research on Video Advertising

Driven by advancements in electronic information technology, video advertising has permeated various digital channels and plays an increasingly pivotal role in marketing communications [10]. On platforms like Instagram, video-based product advertisements outnumber static images, while YouTube has evolved into the second largest search engine. Even in live and outdoor displays, dynamic presentations are replacing static images, with large LED signs and billboards continually showcasing product videos to consumers [11]. Undoubtedly, video has become a crucial medium through which consumers interact with the external world.

Consequently, academia has extensively studied video advertising. Regarding the effectiveness of video ads

compared to static images and text-based ads, dynamic video advertisements have been shown to elicit stronger targeted responses [12], faster click-through rates [13], higher arousal levels [14], and better ad recall [12, 13]. Some studies have focused on different types of video ads; for instance, Campbell et al. (2017) explored pre-roll video ads, noting that attention-grabbing features in this format not only can be redundant but also increase the likelihood of consumers skipping the content altogether [15]. Other studies have investigated presentation aspects of ads, such as Newstead & Romaniuk (2010), who found that 15-second TV ads can achieve 80% of the recall and liking of 30-second ads [16]. Sundar & Kalyanaraman (2004) examined the effect of motion speed in online video ads on consumer arousal, memory, and impression formation [14]. Jia et al. (2020) studied how the speed of product motion in video ads affects consumers' perceptions of product size, finding that faster motion tends to diminish consumers' perceived size of the product compared to slower motion [11]. Zhao et al. (2020) focused on the interaction between subtitles in video ads and product involvement [17], while Campbell et al. (2019) investigated strategies for deploying silent video ads [18]. Additionally, studies have explored the environmental placement of video ads; for example, Yim, Yoo, and Till (2010) demonstrated that in-store video ads can effectively enhance consumer recall, recognition, brand familiarity, and purchase intentions [19].

From the viewer's perspective, Teixeira, Wedel, and Pieters (2012) focused on consumer emotional engagement and attention during the viewing of video advertisements. They found that surprise and joy effectively capture audience attention and retain viewers, with surprise having the greatest impact on attentional focus and joy having the strongest effect on viewer retention [20]. Other studies have explored consumer perceptions of the intrusiveness [21] and attitudes [22] toward video advertisements.

In summary, this paper synthesizes existing literature from two perspectives: the characteristics of video advertisements themselves and the behaviors of viewers of video advertisements. Scholars have extensively studied the role, types, presentation formats, and environmental placements of video advertisements. Concurrently, research on viewers has primarily focused on their emotional and cognitive responses during the viewing process.

2.2 The Presentation Speed of Video Advertisements

Video advertisements prominently feature motion [23], which distinguishes them from static advertising forms like images and text. Motion inherently attracts attention within the visual field [12, 14]. Advancements in computer software enable advertisers to manipulate motion in various ways, allowing for rapid or significantly slowed transitions between frames in ad design. Additionally, differences in broadband capabilities and variations in hardware and connectivity can affect the playback speed of fast-paced video advertisements, potentially reducing their dynamic impact [14]. These factors contribute to the variability in the speed of video advertisements.

Currently, there is a relative scarcity of research in the marketing field on the presentation speed of video advertisements. Sundar & Kalyanaraman (2004) studied the effects of motion speed in online video ads on consumer arousal, memory, and impression formation. Their motion sequences primarily involved a series of static images transformed through sequential changes. Under fast-speed conditions, they presented 55 frames per minute, while under slow-speed conditions, they presented 21.5 frames per minute. Jia et al. (2020) examined how the speed of product motion in video ads affects consumer perception of size. They found that when product motion is fast, consumers perceive the product to be smaller, whereas when motion is slow, consumers perceive the product to be larger. Product motion speed refers to the rate of movement of the physical entity or its parts around an axis, such as rotation, vibration, bouncing, movement of parts, or changes in shape, rather than velocity. In daily life, consumers frequently encounter video ads that display product motion. Consequently, they develop subjective reference points to judge whether the product motion speed in video ads is relatively fast or slow. The aforementioned studies primarily focus on consumer perception without clearly defining what constitutes fast or slow motion speed.

In videos predominantly presented in slow-motion, we refer to them as slow-motion videos, whereas those predominantly presented in fast-motion are termed fast-motion videos. Additionally, presentation speed differs from playback speed. In current internet conditions, viewers can independently adjust playback speeds on video websites to original speed, 0.5x speed, 1x speed, or 2x speed, which are adjustments made by the viewers themselves based on the original pace. The presentation speed defined in this paper is controlled by the creators of the advertisement, representing the inherent speed of the video ad itself. Based on these points, the main hypotheses of this paper are formulated:

H1: Slow-motion advertisements can enhance consumers' attitudes towards the advertised brand.

2.3 Cognitive Load Theory

Cognitive Load Theory, initially proposed by scholar Sweller, defines the psychological cognitive resources individuals expend during information processing [24]. According to this theory, due to the limited capacity of the human brain, individuals have finite cognitive processing abilities and resources. When engaged in specific tasks, individuals can perform several cognitive activities simultaneously, but each activity consumes cognitive resources. The allocation of cognitive resources follows the principle of "constant total amount, trade-off between tasks," meaning that a task requiring higher cognitive resources reduces the resources available for other tasks [25]. Sweller [26] further identifies key factors influencing cognitive load, including the manner of information presentation, the nature of information, and the expertise of the information processor. Different modes of information presentation, such as text-only, image-only, or combined text and image presentations, require varying levels of cognitive load among individuals. The nature of information refers to the quantity of information presented and the relationships between pieces of information; more information necessitates greater cognitive resources for

processing, thereby increasing cognitive load. When information processors possess extensive prior knowledge and experience, they require fewer cognitive resources, leading to reduced cognitive load. Exceeding the effective processing capacity of consumers with information cues can diminish their shopping experience [27] and subsequently lower their brand attitudes. Therefore, the following hypotheses are posited based on these premises:

H2: Cognitive load mediates the impact of slow-motion advertisements on consumers' brand attitudes.

2.4 Focused Thinking

In the pursuit of goal-directed behavior, individuals tend to focus on two aspects: the outcome state and the action process [28]. Cognitive focus refers to the varying degrees of significance given to the process versus the outcome in the pursuit of goals [29]. Different cognitive focuses lead to distinct mental simulation processes among consumers [30], including rehearsal of possible future events, replaying past events, fantasizing, or mixing elements of reality and imagination [31]. By constructing pathways to reach the future, mental simulation effectively facilitates connections between thoughts and behaviors [32].

Recent years have seen abundant research demonstrating the crucial role of mental simulation in influencing consumer attitudes and behaviors, thus integrating it widely into theory and marketing practices [33,34]. This type of cognitive focus in mental simulation can conceptually be understood as an individual trait, focusing either on the process or the outcome. Alternatively, it can be viewed as a controlled state variable that changes based on situational factors or experimental manipulations [35,36]. For instance, Escalas and others have shown that in advertisements presenting strong arguments, process-focused consumers exhibit significantly increased willingness to purchase products like shampoo compared to outcome-focused consumers [37]. Similar techniques are frequently used in advertisements for fitness products and knowledge-based products to stimulate consumer purchasing intentions.

Process focus refers to individuals' attention on the process of achieving a result through actions X and Y, including articulation of both the action process and the final outcome [38]. On one hand, process focus activates individuals' planning processes [32], prompting them to consider questions like "how goals are achieved" and "which behaviors contribute to goal attainment." This forms specific, detailed plans that enhance individuals' perceived control and efficacy, thereby boosting behavioral motivation [38]. Process simulation encourages people to imagine the specific steps and processes involved in achieving their goals, emphasizing cognition [39]. Armitage and others have shown that process simulation can influence people's behavioral intentions, gradually increasing attitudes, subjective norms, and perceived control, while reducing anxiety and concern, thereby enhancing behavioral planning [40]. Han Dechang and others demonstrated that process simulation reduces individuals' anxiety, enhances their rational analysis and planning ability in purchasing decisions, and effectively reduces impulsive buying behaviors [32]. In contrast, compared to process focus on the process of goal achievement, outcome focus emphasizes more on the final state of actions and the positive emotions they bring, addressing the question of "why pursue this goal" [37]. This outcome focus primarily highlights the significance of the goal's end state for individuals.

Based on the above discussion, consumers with a process focus tend to pay attention to more details of advertised products. Slow-motion video advertisements precisely amplify and showcase these details, thereby enhancing consumers' evaluations of the advertised products. Conversely, consumers with an outcome focus emphasize what the product can offer them in terms of final outcomes and may not heavily consider the product details presented in slow-motion within video advertisements. Therefore, only the "final outcome" can influence consumer evaluations. Based on this reasoning, the following hypothesis is proposed:

H3: Cognitive focus moderates the effect of slow-motion on consumer brand attitudes.
H3a: For consumers with a process focus, slow-motion enhances consumer brand attitudes.
H3b: For consumers with an outcome focus, the effect of slow-motion on consumer brand attitudes is not significant.

3. Experimental Design and Results

3.1 Study 1

The purpose of Experiment 1 was to investigate whether a main effect holds, i.e., whether slow motion in brand advertisements improves consumers' brand attitudes. We manipulated the speed of video clips within subjects (slow motion and regular speed) and measured preferences and perceived smoothness for each clip. We predicted that slow motion would increase brand attitudes by reducing consumers' cognitive load and thus improving brand attitudes.

A preexperiment was first conducted in which subjects were divided into two groups, a slow motion group and a control group (regular speed), and consumers were asked to rate the slow motion of the two advertisements (i.e., whether or not they perceived the presence of slow motion in the advertisements). The results indicated that subjects in the group with the ad with slow motion significantly perceived the slow motion component ($M_{\text{slow motion}} = 5.64$ vs. $M_{\text{regular}} = 3.72$; $t = 27.48$, $p < .01$).

Experiment 1 formally started by recruiting subjects (87 female students, $M_{\text{age}} = 20.73$, SD = 1.53) mainly in Credamo platform, and the subjects were divided into two groups, (slow motion group vs. control group). The two groups of subjects watched advertisements possessing a slow motion component and regular speed advertisements, We measured liking ("How much do you like this video clip?"; 1 = "Not at all, "; 1 = "Not at all, " and 7 = "Very much") and then fluency ("The process of studying this video clip is ..."; 1 = "difficult,"). "; 1 = "difficult," and 7 = "easy"; Graf, Mayer, and Landwehr 2018). Scales measuring cognitive load typically address multiple aspects, such as attentional focus, memory load, and task load. We focus mainly on the dimensions of attention focus and memory load ("How much attention does watching this video

require from you"; "Do you need to remember a lot of information while watching the commercial?; Can you remember all the steps and requirements of the task?" ; 1 = very little, 7 = very much.) . All subjects filled out a scale about attitudes toward the brand, and the results of the experiment showed that subjects in the slow-motion group had greater overall attitudes toward the ads than those in the normal group ($M_{slow\text{-}motion}$ = 5.64 vs. $M_{control}$ = 3.72; t = 27.48, p < .01). Finally, proxy variables were excluded: self-efficacy, trust (e.g., "In the face of difficulty, if I do it I will overcome it"; "This product is reliable"; Gravey et al. 2015; Ferrin et al. 2007). Subjects filled in demographic variables.

Cognitive load mediated the effect of slow motion on product attitudes. Compared to regular speed, the inclusion of slow motion resulted in lower cognitive load as consumers watched the advertisement video ($M_{regular\ speed}$ = 4.72 vs. $M_{slow\text{-}motion}$ = 4.03, t = 3.66, p < .01). In order to test the mediating role of cognitive load, the present study drew on the Bootstrap mediation analysis proposed by Zhao et al. (2010) and referred to the moderated mediation analysis model (Model 7) proposed by Hayes (2013) for the mediator variable test (5000 sample size, 95% confidence interval). Specifically, the mean of the indirect effect size was .5933, and the confidence intervals for the Bootstrap test were [LLCI = .2774, ULCI = .9353], with intervals that did not contain zero, indicating a significant indirect effect.

Experiment 1 verified the main and mediating effects, i.e., H1: slow-motion ads increase consumers' attitudes toward the advertised brand; H2: cognitive load mediates the effect of slow-motion ads on consumers' attitudes toward the brand.

3.2 Study 2

The purpose of Experiment 2 was to verify the moderating effect of the thought-focused approach, i.e., for process-focused consumers, the effect of slow motion on consumer brand attitudes was enhanced; for outcome-focused consumers, the effect of slow motion on consumer brand attitudes was not significant.

This experiment utilized a two-factor simple between-groups design: 2 (slow-motion group vs. control group) x 2 (process-focused vs. outcome-focused). One hundred and thirty-nine subjects (70 males and 69 females) were recruited from a comprehensive university in Nanjing to participate in this experiment, and each participant was randomly assigned to one of the 4 conditions and received a stationery gift at the end of the experiment. At the end of the experiment, 10 invalid questionnaires were excluded, making a total of 129 questionnaires; invalid questionnaires were excluded due to dropping out, incomplete or unqualified answers, such as answers of all 1's or 7's; the mean age of valid subjects was 24.09 years old, with an SD = 1.78. Subjects were randomly assigned to four experimental groups, i.e., the slow-motion group & the process-focused group; the slow-motion group & the outcome-focused group; the control group & the process-focused group; the control group & the outcome-focused group; the control group & the process-focused group; and the control group & the process-focused group. The subjects were randomly assigned to four experimental groups, i.e., slow motion group & process focus group; slow motion group & result focus group; control group & process focus group; control group & result focus group.

Similar to Experiment 1, the four groups of subjects similarly watched advertisements with a slow-motion component and regular-speed advertisements. We measured liking ("How much do you like this video clip?"; 1 = "Not at all," and 7 = "Very much"). Examine the goal-focused approach to activation (Escalas & Luce, 2004): process-focused (e.g., "How much do you think about using the product when you see the ad") and outcome-focused (e.g., "How much do you think about the product brought you benefits"). Fill in the Brand Attitude Scale and finally the demographic variables.

According to the results of the experiment, there was a significant difference in terms of consumers' slow motion perception ($M_{regular\ speed}$ = 2.30, $M_{slow\text{-}motion}$ = 3.24, F (1,126) = 11.11, p < 0.01). In addition, there was no significant difference between the subjects' advertisement liking and familiarity in each group, respectively F (5, 123) = 0.99, p > 0.05, F(5, 123) = 1.20, p > 0.05, which effectively ruled out the interfering effects of advertisement liking and familiarity. Regarding brand attitude, the slow-motion group-process focused group improved consumers' brand attitude more than the slow-motion group-outcome focused group, and the results were significant ($M_{process}$ = 4.13, SD = 1.12, $M_{outcome}$ = 3.23, SD = 0.82, F (1, 38) = 8.35, p < 0.01)). This indicates that for process-focused consumers, the effect of slow motion on consumer brand attitude is enhanced; for outcome-focused consumers, the effect of slow motion on consumer brand attitude is insignificant. That is, hypothesis 3 is verified. That is, thought focusing style as a moderating variable of the effect of slow motion on consumer brand attitudes. For process-focused consumers, the effect of slow motion on consumer brand attitudes is enhanced; for outcome-focused consumers, the effect of slow motion on consumer brand attitudes is insignificant.

4. Conclusion

This paper focuses on the effects of slow motion on consumer brand attitudes. It is found that slow-motion advertisements can improve consumers' attitudes toward brands, cognitive load mediates the effect of slow-motion advertisements on brand attitudes, and thought focusing style serves as a moderating variable of slow-motion on consumers' brand attitudes. The thesis also explores the effect of slow motion on brand attitudes within advertisements, the mediating mechanism of the effect of slow motion on brand attitudes within advertisements, and the boundary conditions of the effect of slow motion on brand attitudes within advertisements. The research method is mainly adopted as literature review method and empirical research method.

Although this article has made a valuable contribution to exploring the impact of slow motion on consumer brand attitudes, there are still some shortcomings, and these aspects can be further explored in depth and improved in future research: first, the article may be limited by the selection of the research sample, such as factors such as geographic location, age, gender, and cultural background may not have been adequately taken into account, which may lead to limited

generalizability of the findings. Future studies should endeavor to expand the scope of the sample and increase the diversity and representativeness of the sample in order to improve the broad applicability of the findings. Second, the empirical research component may be limited by certain aspects of the experimental design, such as the degree of simulation of the experimental scenarios, the singularity of the experimental tasks, and the brevity of the experimental time, all of which may not be able to fully simulate the complexities of the real market environment. Therefore, future research can design experiments that are closer to actual consumption situations to enhance the ecological validity of the experimental results. Finally, the article mainly focuses on short-term changes in brand attitudes, but lacks an exploration of the possible long-term effects of slow-motion advertising (e.g., brand loyalty, willingness to make repeat purchases, etc.). Future research could design longitudinal follow-up studies to comprehensively assess the long-term effects of slow-motion advertising on consumer brand attitudes. As a hot research technology, moving target tracking technology has been widely used in various fields. With the help of low cost, low power consumption, self-organization and high error tolerance of wireless sensor networks, moving target tracking based on wireless sensor networks also has broad application prospects.

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