

Article

The Effect of Product Placement in Animation on Generation Z Consumers

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Abstract: In recent years, the animation market in China has flourished, and many brands use animation as a popular promotional platform to showcase their products and brands through product placement, benefitting from this marketing approach. Therefore, there is an urgent need to investigate the impact of product placement on Generation Z consumers—the primary audience for animation. In this study, we used popular Chinese animation to investigate Generation Z consumers' cognition, attitude, and purchase intention regarding product placement. The results show a significant correlation between brand cognition, attitude, and purchase intention. Low-profile brands achieve better product placement effects in animation than high-profile brands. This study also established a mathematical model of participants' post-cognition, post-attitude, and post-purchase intention regarding product placement in animation through factor analysis. This mathematical model intuitively shows that the effect of product placement in animation is primarily determined by the audience's post-attitude.

Keywords: Generation Z; consumer behavior; Chinese animation; product placement; cognition; attitude; purchase intention

1. Introduction

In *Popeye*, every time Popeye eats a can of spinach, he becomes extremely strong. This caused an increasing number of people to start eating spinach, leading to a 33% increase in spinach sales in the United States in the 1930s [1]. In the Chinese animation *One Hundred Thousand Bad Jokes II* (2017), the protagonist uses a launcher to launch a “chestnut”, while three squirrels drool as they watch the chestnut streak across the sky. Although the logo is not displayed, the audience can understand that this is an advertisement for the brand “Three Squirrels”. Products or brands implanted in animations with special designs are called product placements [2].

In the past few decades, several researchers have studied the effect of product placement on movies [3], television programs [4,5], online games [6], and other social media [7,8]. Different from other media, animation is a special form of media that grants one the fantastic ability present any imaginary subject, allowing product placement to break free from the constraints of “reality” [9]. In animation, the implantation forms can be more diverse, such as using parody and humorous ways to change the real product design, allowing the products to better fit the plot [10]. However, only a small percentage of researchers chose animation as a research subject, and existing research about product placement in animations focused more on its impact on children [11,12], while ignoring the Generation Z group. Generation Z, corresponding to individuals born from 1990 to 2010, is a young generation. Its members are very familiar with animation, comics, games, and novels (ACGN) culture; are willing to accept new things; and constitute the main consumer group of animation and anime derivatives [13]. In addition, mathematical models were rarely mentioned in previous research, making it difficult to quantitatively evaluate the effect of



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product placement in animations. Therefore, it is of great significance to explore the impact of product placement in animations on the Generation Z group, along with the derivation of its mathematical expression.

According to the research gap, three objectives were raised for this study. Firstly, this study aimed to discuss the impact of implanting high-profile and low-profile brands into animations on Generation Z consumers [14,15]. Secondly, this study aimed to identify the intrinsic correlation between the three influencing factors in evaluating the effect of product placement [16–18]. Thirdly, based on the collected data, the research also aimed to establish a quantitative mathematical model and identify the most influential factor.

Therefore, based on these objectives, Chinese Generation Z consumers were selected as the research object ($n = 108$), and seven popular animations from 2014 to 2022 were selected as the animation sample set. A total of ten implanted brands were included in the selected animations and used as a test option to ascertain the cognition, attitudes, and purchase intentions of Generation Z consumers toward the products appearing in the animations.

2. Research Background and Hypothesis

2.1. Product Placement

Product placement originally referred to the integration of brands, product services, and representative visual symbols into movies, TV dramas, or videotapes [19], eventually spreading to all entertainment products and becoming an integral part of mass media [20]. Through combining product information with a plot, a brand's impression is subtly conveyed to the audience, thereby improving product familiarity and promoting consumption [21,22].

In research on the effect of product placement in animation, most researchers have chosen children as the research objects. Some studies pointed out that children's attitudes toward animation can transfer to their attitudes toward the implanted product [23], while moderate plot implantation can win the favor of a child audience [24]. The results of Beaufort's research have shown that children are very susceptible to the influence of implicit persuasive information from product placement [25]. The research conducted by Navas et al. further demonstrated that multiple disclosures of product placement and embedding the product into the plot can directly affect the audience's consumption behavior [26]. Based on previous research, this study explains the effects of product placement in animation from three parts: cognition, attitude, and purchase intention.

2.2. Cognition Effect

The evaluation of cognitive effects is mainly based on an audience's awareness of, interest in, memory, and understanding of a product or brand. A compound form of expression combining hearing and vision can result in better cognition than a single form of expression [27].

Matthes and Naderer's research found that a high frequency of placement can enhance brand memory and have a significant impact on the consumption of an implanted product [28]. Boerman et al.'s research indicated that the cognition level for an implanted product would increase immediately after disclosure, and high cognition levels can enhance brand memory [29]. However, the high frequency of placement also undermined the concealment of product placement, forcing audiences to recognize the brand, which in turn increased their resistance to the brand [5]. In order to evoke memories of the brand or product, Cárđaba et al. suggested that product placement should be integrated with storylines [30].

Some research revolves around brand awareness. Brand awareness is related to brand cognition, and it can be measured as the ability of consumers to recognize a brand under different conditions [31]. Babin et al.'s research demonstrated that, compared to low-profile brands, high-profile brands were more likely to attract audiences' attention [14], which made brands more easily recognized [32]. Ong et al.'s research indicated that brand awareness had a significant influence on audiences' attitudes [33]. From the perspective

of consumers' purchase intention, Auty and Lewis's study proved that after watching the product placement, audiences were much more willing to consume the implanted products that were recognized as opposed to the unrecognized ones [34]. It is worth noting that the research conducted by Campbell et al. suggested that audiences subconsciously protect themselves from the persuasion of high-profile brand marketing, and sometimes this protection can lead to negative emotions [15].

Therefore, we developed the following hypothesis:

H1: *Compared to low-profile brands, implanting high-profile brands in animation can better enhance the effect of product placement.*

2.3. Attitude Effect

Attitude effects can be interpreted as emotions toward and preferences regarding product placement [35]. In Chinese media, where product placement is ubiquitous, people generally have a positive attitude toward it [36]. The existing research has analyzed the attitude effect from multiple perspectives, including implanted media and products. Regarding implanted media, young audiences have a higher tolerance for product placement in media such as movies and TV programs compared to songs and games [37]. Concerning the implanted products, those that do not require careful consideration or experience before making a purchasing decision, such as snacks, are more popular [38].

Mackay et al.'s research investigated the impact of product placement on an audience's attitude toward and recall of a brand, proving that product placement can significantly increase an audience's favorability [39]. Gillespie et al. proposed that the consistency between the product placement with both the narrative's story structure and affective tones would be more conducive to improving brand attitudes [40]. The study by Dens et al. indicated that even if an audience had never heard of an implanted brand before, product placement could have a direct impact on the audience's attitude toward it [41]. However, if a product appeared in a film with unfavorable reviews, or if the implantation was associated with negative characters, the audience's attitude toward the brand would be negatively impacted [42]. Similarly, the study by de Gregorio and Sung also showed that brand attitudes were easily influenced by negative information [35].

2.4. Purchase Intention

Purchase intention mainly refers to an audience's purchase tendency, purchase behavior, and product usage behavior after being subjected to product placement [43]. According to Freud's theory, human consciousness is an iceberg: Consciousness is analogous to the small part of the iceberg above the surface of the water, while the unconscious hidden under the surface is considerably larger and plays an active role [44]. Product placement involves integrating a product and its information into the content of media so that the audience unconsciously receives advertising information and is more likely to generate suggestive memories, helping strengthen the audience's post-purchase intention [45].

However, due to the difficulty of capturing and measuring an audience's subconsciousness, Davtyan et al.'s research focused on the disclosure rate of product placement, proving that over-disclosure not only failed to generate positive feedback but even had negative impacts on an audience's cognition and attitude toward a brand, thereby suppressing the audience's purchase intention [16]. Their research also proved that in the case of non-over-disclosure, the moderate repetition of displays of brands can lead to better brand memory and awareness among audiences, thereby increasing their willingness to purchase.

Some previous research demonstrated that there exists a positive correlation between cognition, attitude, and purchase intention toward a brand [46]. Dens et al.'s research indicated a weak correlation between brand cognition and brand attitude [41]. Huang and Deng's research further proved that audiences' attitudes toward an implanted brand had a significant impact on their purchase intention [17]. Vanwesenbeeck et al. found that a

significant correlation existed between the cognition and purchase intention of the brand: that is, the higher the level of brand cognition, the stronger the willingness to purchase [18]. Therefore, we developed the following hypotheses:

H2a: *There exists a correlation between brand cognition and attitude.*

H2b: *There exists a correlation between brand cognition and purchase intention.*

H2c: *There exists a correlation between brand attitude and purchase intention.*

According to the research objectives, this study discusses the effects of product placement in animation with respect to three aspects, cognition, attitude, and purchase intention, and explores the relationship between these three indicators. This study also provides a detailed description of the impact of brand awareness on the effectiveness of product placement. The research framework is shown in Figure 1.

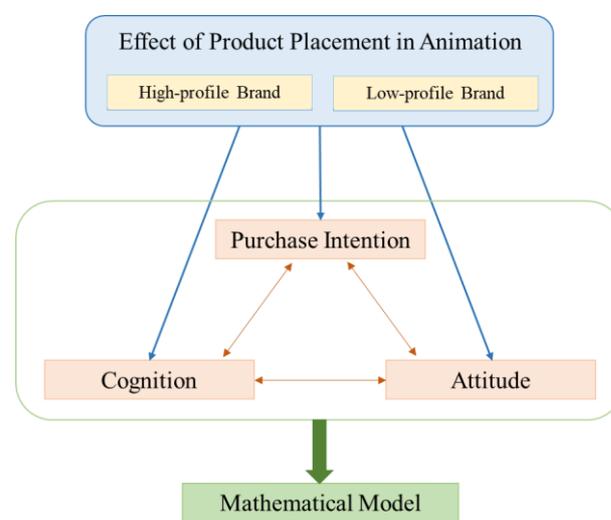


Figure 1. Framework of this research.

3. Methods

Based on the research objectives and hypotheses, this study selected brands appearing in animations as testing options and the survey questionnaire as data collection methods so as to provide a clear reflection of the audience's pre- and post-evaluations of the brand cognition, attitude, and purchase intention. Meanwhile, as the participants were all from the Generation Z group, they were able to adapt to the multi-item Likert scale, which quantified the audiences' subject evaluation of the implanted brand. Therefore, this study adopted the survey questionnaire as the research method.

3.1. Research Design

For this study, the questionnaire survey method was used to collect data on the participants' cognition, attitudes, and purchase intentions toward the implanted brand before and after watching the animation in order to evaluate the effect of product placement in animation. The entire questionnaire survey procedure consisted of four parts: (1) providing informed consent; (2) completing the pre-test questionnaire; (3) watching animation segments; and (4) completing the post-test questionnaire. The questions in the pre-test and post-test questionnaires were specially designed, and the 5-point Likert scale was adopted so as to intuitively evaluate the participants' feelings toward the implanted brand.

For cognition, attitude, and purchase intention, the meanings of the five scores are listed in Table 1.

Table 1. Meanings of the 5-point Likert scale.

| | Score | Description |
|--------------------|-------|---|
| Cognition | 1 | Never heard of the brand |
| | 2 | Heard of the brand but unfamiliar with its products |
| | 3 | Heard of the brand but familiar with only a few of its products |
| | 4 | Heard of the brand and am familiar with some of its products |
| | 5 | Heard of the brand and familiar with most of its products |
| Attitude | 1 | Low favorability toward the brand |
| | 2 | Slightly low favorability toward the brand |
| | 3 | Neutral |
| | 4 | Slightly high favorability toward the brand |
| | 5 | High favorability toward the brand |
| Purchase Intention | 1 | No purchase intention whatsoever |
| | 2 | 25% willingness to purchase |
| | 3 | 50% willingness to purchase |
| | 4 | 75% willingness to purchase |
| | 5 | 100% willingness to purchase |

3.2. Sample Animations and Participants

After excluding animations without product placement, seven famous Chinese animations from 2014 to 2022 were selected for this study. A list of the selected animations is presented in Table 2.

Table 2. Animations selected for the experiment.

| No. | Name | Year | Type |
|-----|--|------|---------------|
| 1 | <i>One hundred thousand bad jokes I</i> | 2014 | Animated Film |
| 2 | <i>The King's avatar I</i> | 2017 | Anime |
| 3 | <i>One hundred thousand bad jokes II</i> | 2017 | Animated Film |
| 4 | <i>Dou Luo continent I</i> | 2018 | Anime |
| 5 | <i>Fei Ren Zai</i> | 2018 | Anime |
| 6 | <i>Wish Dragen</i> | 2021 | Animated Film |
| 7 | <i>Three body</i> | 2022 | Anime |

According to the principle of statistics, there is a mathematical relationship between significance (α), statistical power ($1 - \beta$), effect size (ES), and sample size (n). For this research, the online software product “Understanding Statistical Ability and Significance Testing” was employed to estimate the sample size [47], with the level of significance (α) set to 0.05, statistical power ($1 - \beta$) set to 0.8, and the effect size (ES) set to 0.5. Based on the calculation results, the total sample size needed to be at least 31.4.

Therefore, a total of 130 participants were recruited in this study. All participants identified themselves as Generation Z consumers and watched Chinese animations more than once a month.

3.3. Research Procedure

3.3.1. Informed Consent

All participants were promised that the questionnaire would be used only for research and that their personal information would be strictly protected. The participants were informed about all parts of this experiment and voluntarily agreed to participate.

3.3.2. Pre-Test Questionnaire

Before watching segments from animated films and anime, pre-test questionnaires were distributed to Generation Z consumers to collect data on their initial cognition, attitudes, and purchase intentions with respect to the corresponding product or brand. In the pre-test questionnaire, 13 brands were included, along with 3 irrelevant brands to prevent

a question in the pre-test questionnaire from generating prompts for the participants in the post-test questionnaire. A list of the selected brands is presented in Table 3.

Table 3. Selected brands for the questionnaire.

| No. | Test Option Brands | No. | Interference Option Brands |
|-----|-----------------------|-----|----------------------------|
| 1 | Three Squirrels | 1 | Fanta |
| 2 | Master Kong Green tea | 2 | OPPO |
| 3 | Su Ning | 3 | BMW |
| 4 | Xingxin Internet | | |
| 5 | McDonald's | | |
| 6 | Pizza Hut | | |
| 7 | Qinqin Snack | | |
| 8 | Changan Deepal | | |
| 9 | MI | | |
| 10 | Tencent | | |

3.3.3. Watching Animation Segments

After completing the pre-test questionnaire, the participants were asked to watch the excerpted segments of the seven selected animations. In order to simulate the actual viewing experience, the total length of excerpted segments was limited to 90 min, nearly the same length as an actual animation. Additionally, the excerpted segments were independent and complete in order to reduce the impact of incoherence. To avoid the results being influenced by the viewing order, every selected segment was played in random order.

3.3.4. Post-Test Questionnaire

Thirty minutes after they had watched the animation segments, post-test questionnaires were distributed to the participants to collect data on their post-cognition, post-attitudes, and post-purchase intentions about the brand. The tested brands were the same as those used in the pre-test questionnaire.

3.4. Data Analysis

After the pre-test and post-test surveys, there were 108 valid responses. SPSS 21.0 was used to conduct a paired *t*-test, correlation analysis, and factor analysis.

4. Results and Discussion

Cronbach's α was used to evaluate the reliability of the questionnaire. Table 4 shows that the Cronbach's α values for cognition, attitude, and intention were greater than 0.8, indicating the questionnaire's high internal consistency and reliability according to Guilford's theory [48].

Table 4. Reliability analysis of cognition, attitude, and purchase intention reported in the questionnaire.

| Variable | Index | Cronbach's α |
|-----------|----------------------------|---------------------|
| Cognition | Initial cognition | 0.877 |
| | Post cognition | 0.905 |
| Attitude | Initial attitude | 0.865 |
| | Post attitude | 0.874 |
| Intention | Initial purchase intention | 0.867 |
| | Post-purchase intention | 0.872 |

4.1. Evaluation of the Effect of Product Placement

A paired *t*-test was conducted on the pre-test and post-test results to analyze Generation Z consumers' cognition, attitudes, and purchase intentions regarding product

placement in famous Chinese animations (Table 5). The results showed that all significance values were less than 0.001, indicating that Generation Z consumers' cognition, attitudes, and purchase intentions toward the implanted brand were effectively enhanced after observing the implanted product.

Table 5. Paired *t*-test analysis of product placement effects.

| Variable | Index | Statistic Description | | | Paired <i>t</i> -Test for Product Placement Effect | | | | |
|-----------|----------------------------|-----------------------|---|-------|--|-------|----------|------------------|------------------|
| | | Mean | ± | SD | Mean | SD | <i>t</i> | Sig. | Cohen's <i>d</i> |
| Cognition | Initial cognition | 3.003 | ± | 1.589 | 0.684 | 1.575 | 14.281 | <i>p</i> = 0.000 | 0.472 |
| | Post-cognition | 3.687 | ± | 1.296 | | | | | |
| Attitude | Initial attitude | 3.063 | ± | 1.364 | 0.165 | 1.219 | 4.441 | <i>p</i> = 0.000 | 0.127 |
| | Post-attitude | 3.228 | ± | 1.234 | | | | | |
| Intention | Initial purchase intention | 2.981 | ± | 1.441 | 0.185 | 1.213 | 5.018 | <i>p</i> = 0.000 | 0.134 |
| | Post-purchase intention | 3.167 | ± | 1.322 | | | | | |

To analyze the product placement effect of brands with varying popularities and based on the results of the Generation Z consumers' initial cognition in the pre-test questionnaire, the types of brands implanted via product placement were divided into high-profile brands (with an initial cognition level ≥ 3) and low-profile brands (with an initial cognition level < 3).

The results demonstrated that for high-profile brands, before the participants were subjected to product placement, 65.3% had clear initial cognition of the brand, 60.2% believed that the brand possessed a good initial attitude, and 59.9% had an initial post-purchase intention for the brand. Conversely, for low-profile brands, the initial cognition ratio of the participants was 15.7%, the brand initial attitude ratio was 13.9%, and the initial purchase intention ratio was 12.5%.

A paired *t*-test was used to analyze the data from the pre-test and post-test questionnaires for high-profile brands, and the results are shown in Figure 2. Through comparison, it was found that the participants' cognition of the implanted brand increased by 0.14 after witnessing product placement (sig. *p* = 0.006), but their attitude toward the brand decreased by 0.14 (sig. *p* = 0.000). Moreover, the average post-purchase intention decreased by 0.07 after submission to product placement (sig. *p* = 0.09).

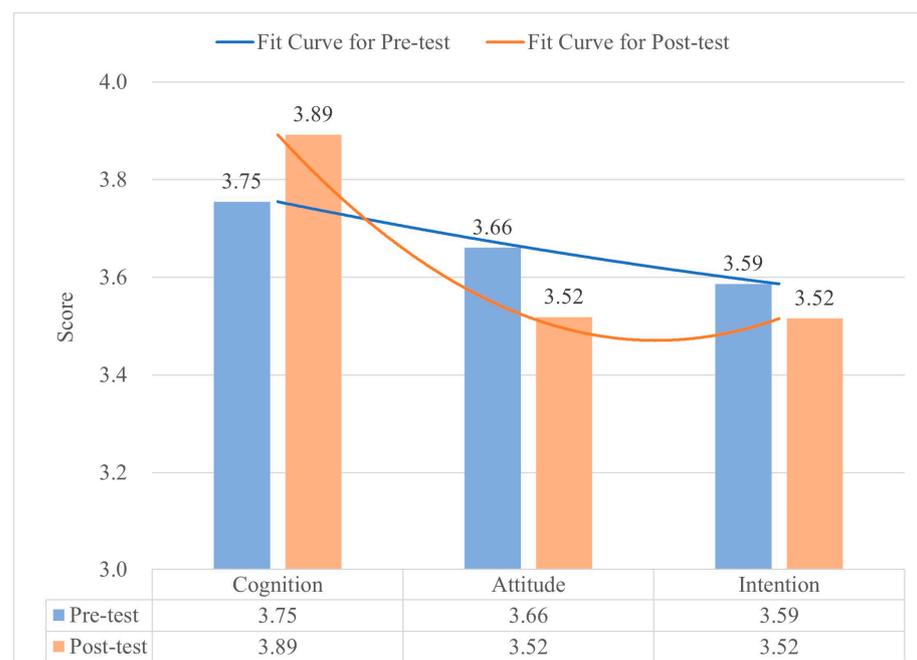


Figure 2. Product placement effect for high-profile brands.

Through a comparison of the data from the pre-test and post-test questionnaires for low-profile brands (Figure 3), it was found that after watching the animations, the participants' cognition of the implanted brands increased by 1.50 (sig. $p = 0.000$), attitudes increased by 0.63 (sig. $p = 0.000$), and the average post-purchase intention increased by 0.57 (sig. $p = 0.000$). This finding reflects a difference from the product placement effect of high-profile brands.

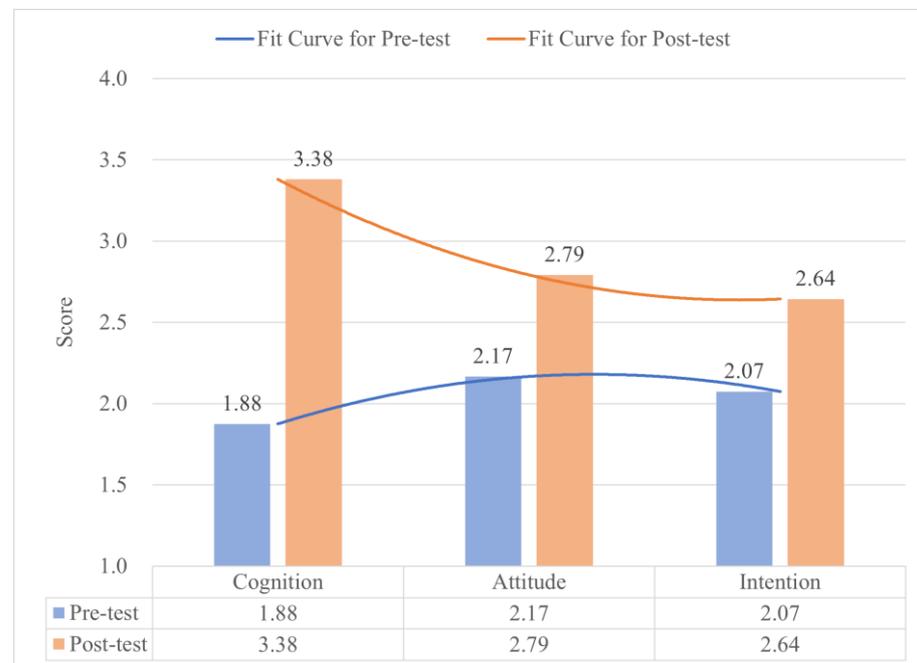


Figure 3. Product placement effect for low-profile brands.

Contrary to what has been shown in previous studies, the effect of product placement for high-profile brands was weaker than that for low-profile brands, refuting H1.

This is because of the limited capacity available for product placement in animation. When the audience notices the brand logo of a high-profile brand in a prominent position in animation, they immediately associate it with the imminent appearance of product placement, which can create a “disturbing the plot” phenomenon [49]. Simultaneously, if the implantation form is not appropriate, such as one that has low integration with the plot, a long implantation time, or excessively prominent implantation images, it will affect the dissemination quality of the product placement and the audience’s perception of the animation, causing aversion to the product and reducing favorability and purchase intention with respect to the brand [50]. Nevertheless, due to the popularity of high-profile brands, consumer preferences and purchase intentions are relatively fixed [51]. Therefore, the negative effects of the inappropriate placement of products made by high-profile brands in a single animation are relatively limited.

Most importantly, audiences are curious about low-profile brands [52]. As long as the implantation method of a low-profile brand does not excessively interfere with the plot, the audience will consider it a part of the plot and have a high tolerance for it [15]. Simultaneously, when a low-profile brand appears in a prominent position, it can rapidly transmit core information about the product to the audience, improving the brand’s popularity and significantly enhancing the audience’s cognition, attitudes, and purchase intentions regarding the brand in question.

Further, notably, for both the pre-test and post-test results, the participants’ post-cognition scores were higher than their post-attitude scores, and the post-attitude scores were higher than the post-purchase intention scores (Figure 4). This is in line with the research on purchasing behavior in marketing [53]. When consumers want to buy products, they first form a general attitude toward them, conduct an overall evaluation of their

favorability and acceptance, and generate their final post-purchase intention based on the evaluation of risks and benefits.

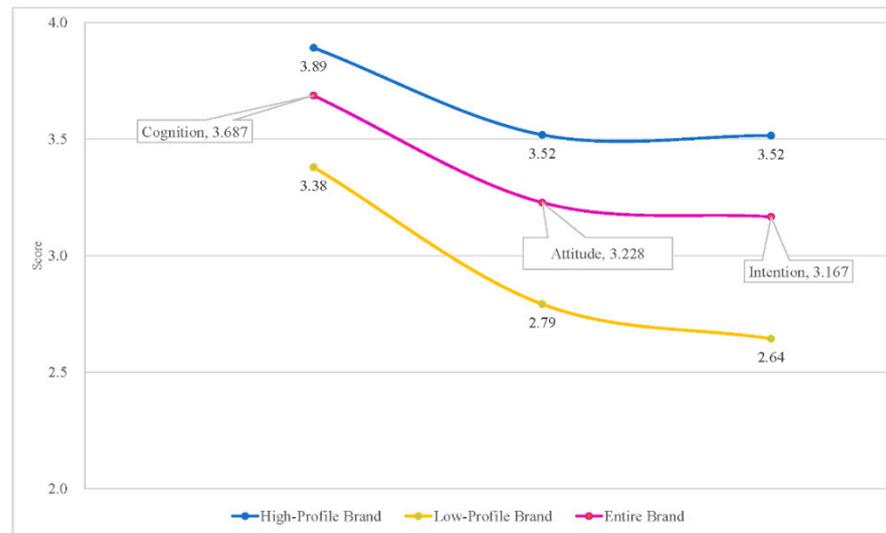


Figure 4. Product placement effect for the entire brands.

4.2. Correlation Analysis

Correlation analysis was conducted using SPSS to examine the relationship between Generation Z consumers' cognition, attitudes, and purchase intentions regarding product placement in famous Chinese animations. Table 6 shows the correlation analysis results for initial cognition, initial attitude, and initial purchase intention for a total sample size of 1080. The results demonstrated that initial cognition, initial attitude, and initial purchase intention were strongly positively correlated. The correlation factor between initial attitude and initial purchase intention was greater than 0.8, demonstrating that initial attitude exerted a significant positive impact on the initial purchase intention.

Table 6. Correlation analysis on initial cognition, initial attitude, and initial purchase intention.

| Pearson Correlation | Initial Cognition | Initial Attitude | Initial Purchase Intention |
|----------------------------|-------------------|-----------------------|----------------------------|
| Initial cognition | 1.000 | 0.687 ($p = 0.000$) | 0.641 ($p = 0.000$) |
| Initial attitude | | 1.000 | 0.865 ($p = 0.000$) |
| Initial purchase intention | | | 1.000 |

A similar relationship was found between post-cognition, post-attitude, and post-purchase intention (Table 7). The total sample size was 1080. The correlation analysis results showed that post-attitude and post-purchase intention were positively and moderately correlated with post-cognition, respectively. A significant positive correlation was found between post-attitude and post-purchase intention, similarly to the corresponding relationship between initial attitude and initial purchase intention.

Table 7. Correlation analysis for post-cognition, post-attitude, and purchase intention.

| Pearson Correlation | Post-Cognition | Post-Attitude | Post-Purchase Intention |
|-------------------------|----------------|-----------------------|-------------------------|
| Post-cognition | 1.000 | 0.599 ($p = 0.000$) | 0.561 ($p = 0.000$) |
| Post-attitude | | 1.000 | 0.834 ($p = 0.000$) |
| Post-purchase intention | | | 1.000 |

According to the correlation analysis results, there was a correlation between cognition, attitude, and purchase intention, where H2a, H2b, and H2c were deemed correct. It is

worth mentioning that attitude and purchase intention had a strong correlation, which was similar to previous research results [40]. This result is in line with the psychology of consumers: consumers' understanding of products is limited. To reduce the uncertainties involved in purchasing, consumers will form a brand "initial cognition set" according to their perceptions and choose the products and services they need from this set. When consumers choose products from within the brand's initial cognition set, the preferences formed based on brand cognition and attitude affect their purchase intentions [54], and consumers are more willing to choose a brand with high favorability. Therefore, product placement should be integrated into the storyline and connected to positive characters or plots [4] so that the audience can have a favorable impression of the implanted product or brand and further stimulate purchase intention.

4.3. Mathematical Model for Evaluating Product Placement Effect

The previous analysis demonstrated that product placement can affect Generation Z consumers' post-cognition, post-attitude, and post-purchase intention toward a brand, indicating that post-cognition, post-attitude, and post-purchase intention can be used to quantitatively describe the effect of product placement. However, because of the correlation between post-cognition, post-attitude, and post-purchase intention, it was not possible to simply use linear regression to obtain a model involving the effect of product placement and these three variables. Therefore, factor analysis was conducted to obtain the mathematical relationship between the product placement effect and post-cognition, post-attitude, and post-purchase intention.

According to Kaiser and Rice [55], the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's test of sphericity can effectively reveal whether a sample set is suitable for factor analysis. For this research, the KMO value was 0.673, and the significance value of Bartlett's test was 0.000 (Table 8), demonstrating that the sample data were normally distributed and suitable for factor analysis. This also indicates that there is a meaningful relationship between post-cognition, post-attitude, and post-purchase intention.

Table 8. The results of KMO and Bartlett's test of sphericity.

| Kaiser–Meyer–Olkin Measure of Sampling Adequacy | | 0.673 |
|---|--------------------|----------|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 1778.205 |
| | df | 3 |
| | Sig. | 0.000 |

Based on the communalities list (Table 9), the extracted variance of all three variables was larger than 0.6, which indicated that it was acceptable to conduct factor analysis and that the majority of information could remain with acceptable loss. According to the total variance explained list shown in Table 8, only one initial eigenvalue was larger than 1. This demonstrated that only one common factor—the product placement effect—was used to summarize post-cognition, post-attitude, and post-purchase intention.

Table 9. The results of the communalities list and total variance explained list.

| Index | Extraction | Component | Extraction Sums of Squared Loadings | |
|-------------------------|------------|-----------|-------------------------------------|---------------|
| | | | Total | % of Variance |
| Post-cognition | 0.639 | 1 | 2.337 | 77.887 |
| Post-attitude | 0.862 | 2 | 0.499 | 94.511 |
| Post-purchase intention | 0.836 | 3 | 0.165 | 100.000 |

The component scores for post-cognition, post-attitude, and post-purchase intention are summarized in Table 10, and the loading plot and score plot are shown in Figure 5. To

obtain the weights of these three indices, it was necessary to normalize and standardize the component scores.

Table 10. Results for the component score, normalized component score, and standardized component score.

| | Post-Cognition | Post-Attitude | Post-Purchase Intention |
|------------------------------|----------------|---------------|-------------------------|
| Component Score | 0.799 | 0.928 | 0.914 |
| Normalized Component Score | 0.523 | 0.607 | 0.598 |
| Standardized Component Score | 0.303 | 0.351 | 0.346 |

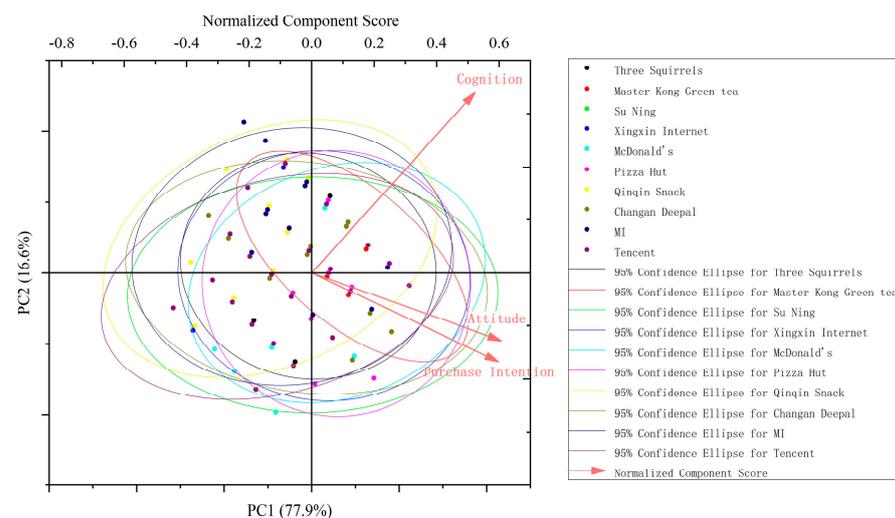


Figure 5. Loading plot and score plot.

Standardization was used to unify the normalized component scores such that the sum of the three normalized component scores was equal to one. The results obtained after standardization are listed in Table 9. The weights for post-cognition, post-attitude, and post-purchase intentions were 0.303, 0.351, and 0.346, respectively. The equation used to describe the product placement effect is as follows:

$$\text{Product Placement Effect} = 0.303 \times \text{Post cognition} + 0.351 \times \text{Post attitude} + 0.346 \times \text{Post purchase intention} \quad (1)$$

Equation (1) establishes an evaluation model for predicting the effect of product placement in animations based on cognition, attitude, and purchase intention.

Through comparing the coefficients of variables in Equation (1), it was determined that post-attitude was the most important factor determining the product placement effect, followed by post-purchase intention, and the weight of post-cognition was the smallest. This proves that for product placement in animation, Generation Z consumers have relatively high acceptance, and product placement can provoke the consumption desire of a group with considerable consumption power. To enhance an audience's attitude toward a brand, it is important to adopt diverse forms of product placement rather than relying on repeated background implantation or the high-frequency display of brand names [30]. Therefore, we suggest that the over-disclosure of product placement in animation should be avoided. Additionally, combining product placement with storylines or closely interacting with the protagonist can help enhance the audience's attitude toward the implanted brand and further enhance the effect of product placement [49].

5. Conclusions

This study analyzed the influence of product placement in animation on audiences' cognition, attitudes, and purchase intentions, as well as the inherent correlations among

them. Based on the cognition, attitude, and purchase intention indices, a mathematical model for evaluating the effect of product placement was developed. The findings of this study led to the following conclusions.

Product placement can enhance Generation Z consumers' cognition, attitude, and purchase intention regarding an implanted brand. This finding differs from the results regarding product placement in other media, in which it was shown that product placement by high-profile brands yielded better results [56]. This study's results show that animation is a marketing channel suitable for product placement by low-profile brands.

This research also shows that there is a significant correlation between the cognition, attitudes, and purchase intentions of Generation Z consumers regarding implanted brands. The results indicate that product placement in animation can enhance consumers' cognition of a brand, enhancing the audience's brand attitude by embedding the product (brand) in the audience's mind and increasing their purchase intention [16].

Through factor analysis, this study established a mathematical model for evaluating the product placement effect using Generation Z consumers' post-cognition, post-attitude, and post-purchase intentions regarding the implanted brand. We expect that this mathematical model can provide an intuitive method for evaluating the effect of product placement in animation and provide theoretical support for subsequent research.

6. Limitations and Future Research

Although the total sample size of this study met the statistical requirements, it was still relatively small, and the participants were all from the northern part of China, which limits the sample to a certain extent. Additionally, in this study, although participants were asked to answer the post-test questionnaire 30 min after watching the selected animation, it is still a short-term survey, and the results of this study can only indicate the short-term effect of product placement in animations on Generation Z consumers. In addition, this study analyzed the impact of single disclosure of product placement on Generation Z individuals, without considering the cumulative impact of multiple disclosure.

In future research, we plan to explore the effect of product placement in animation separately for high-profile and low-profile brands. We also plan to expand the sample size, investigate the long-term effect, and explore the effect of multiple disclosures of product placement in animation on Generation Z consumers.

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