



Predicting Product Placement Marketing through Screen, Script, and Plot Placement Attributes

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ABSTRACT

This study develops a model to predict product placement marketing effectiveness by examining three placement attributes: screen placement, script placement, and plot placement. The objective is to clarify how these attributes are associated with product placement marketing effectiveness and to provide a quantitative basis for product placement strategy and content creation. Drawing on the three-dimensional classification of product placement, the study represents the three attributes as screen, script, and plot placement and measures their relationships through the distance among the attributes. A probability density function is constructed to characterize the relationship between the distance-based placement attributes and marketing effectiveness. Empirical data were collected from a fashion brand's product placement campaign involving 21 YouTube videos and 15 podcast episodes, covering cosmetics, apparel, and handbags. The effectiveness of product placement was assessed through audience responses concerning satisfaction, interest, and entertainment value. A total of 2,658 valid observations were obtained. Of these, 1,063 observations were randomly selected for parameter estimation using maximum likelihood estimation, while the remaining 1,595 observations were used for model calibration. The calibrated model produced a Theil U statistic of 0.3354, indicating acceptable goodness of fit. The findings suggest a positive, concave relationship between product placement marketing effectiveness and the distance-based characteristics of the three placement attributes. The study concludes that balancing and aligning screen, script, and plot placement can improve product placement strategy. Marketing managers and content creators are therefore recommended to coordinate these three attributes when designing placement campaigns and developing branded content.

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INTRODUCTION

The development of digital media has substantially expanded the contexts in which brands can be incorporated into entertainment and consumer-oriented content. Product placement, once predominantly associated with films, television programs, and entertainment narratives, is now implemented across a broader range of media formats and content environments (Aw et al., 2026; Khan & Chapa, 2026; Sharma & Bumb, 2022; Wai Lai & Liu, 2020; Yang et al., 2025). The widespread use of social media, short-form video, and changing patterns of media consumption has further diversified the ways in which products and brands can be embedded in mediated content (Kim et al., 2026; Milovan et al., 2025; Vrtana & Duricova, 2026). Consequently, recent research has increasingly examined product placement from perspectives that extend beyond simple product exposure.

For example, Wai Lai and Liu (2020) investigated product placement acceptance in mobile social networks by examining the relationships among content likeability, content credibility, and social media engagement. Their findings indicate that content likeability is associated with both social media engagement and content credibility, while these factors are also related to users' acceptance of product placement. The study further demonstrates that social media engagement can interact with content likeability in shaping perceived content credibility. Differences between younger and middle-aged users were also identified in the relationships among these variables, suggesting that audience characteristics and patterns of social media engagement may influence responses to product placement.

Audience responses may also depend on how product placement is communicated and disclosed. Using a web-based experimental approach, Chan (2020) examined the effects of prior disclosure of product placement and found that more explicit disclosure was associated with higher brand recall and liking. The study further showed that disclosure could influence brand evaluation indirectly through program liking, while psychological reactance moderated these effects. These findings indicate that the effectiveness of product placement is influenced not only by the presence of a brand within content but also by the manner in which the placement is incorporated and communicated to audiences.

A fundamental framework for describing the structure of product placement was proposed by Russell (1998), who distinguished three dimensions: screen, script, and plot placement. These dimensions represent different levels and forms of brand integration within media content. Screen placement primarily involves the visual presentation of a product or brand within the mediated environment. It may involve creative placement, in which a brand appears as part of the surrounding content, such as a billboard visible within a scene, or on-set placement, in which the product forms part of the physical setting. Thus, screen placement emphasizes the visual presence and visibility of the brand within the content environment (Beuckels & De Wolf, 2025; Noschang & Vogelgesang, 2026; Sharma & Bumb, 2022; Wouters & De Pelsmacker, 2011).

Script placement involves the auditory or verbal mention of products or brands within character dialogue (Khan & Chapa, 2026; Russell, 1998; Russell, 2022). The effectiveness of this form of placement varies based on the content and frequency of the product's mention in the dialogue (Kim et al., 2026; Wouters & Pelsmacker, 2011; Russell & Belch, 2005; Russell, 2022; Vrtana & Duricova, 2026).

Plot placement is characterized by a combination of visual and auditory integration, where products or brands are referenced in character dialogue and simultaneously featured in the film's background (Aw et al., 2026; Du et al., 2023; Noschang & Vogelgesang, 2026; Russell, 1998; Russell, 2022). This approach allows the product or brand to become part of the narrative, facilitating its integration into the storyline while also helping to shape character traits. Consequently, this enhances the perceived connection between the product or brand and the plot (Beuckels & De Wolf, 2025; Yang et al., 2025; Williams et al., 2011).

These three dimensions can indeed be seen as three distinct attributes of content in product placement. Each reflects a different way in which products appear in films and has varying effects on the audience (Noschang &

Vogelgesang, 2026; Yang et al., 2025; Russell, 2022; Williams et al., 2011). Specifically, screen placement primarily focuses on the visual presentation of the product, emphasizing its visibility and aesthetic features within the imagery. Script placement emphasizes auditory elements, enhancing product recognition through character dialogue and influencing the audience's understanding and memory. Plot placement combines both visual and auditory elements, further integrating the product or brand into the narrative and increasing its significance within the overall story (Aw, et al., 2026; Milovan et al., 2025; Wouters and Pelsmacker, 2011; Sharma & Bumb, 2022; Van der Bend et al., 2023). Together, these aspects not only demonstrate the diversity of product placement but also reflect its potential impact on audience experience and brand perception.

Thus, this research uses these three attributes to represent the three-dimensional characteristics and calculates the degree of usage of product placement marketing content by measuring the distances between each attribute and the others. The following will be divided into four main sections. First, a stochastic model for predicting the effectiveness of product placement marketing will be presented. The relevant probability derivations include the probability density function, the cumulative distribution function, and the calculation of expected values. Secondly, the empirical data are introduced. The profile of data includes the demographic information are released. Thirdly, the parameters of the stochastic model are estimated using empirical data. The model calibration is also conducted. Finally, the conclusion is made.

MATERIALS AND METHODS

The Effects of Product Placement Marketing

The relations of the effects of product placement marketing and three attributes of product placement are increase concave curve.

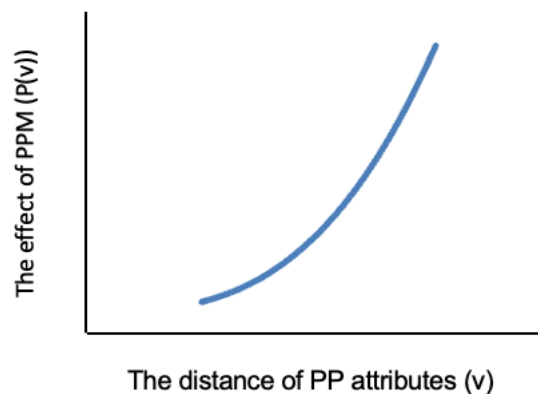


Figure 1. The relationships between the distance of PP attributes and the effect of PPM.

Note: PPM is product placement marketing. PP is product placement

Thus, the function $P(v)$ is described as the relationship between product placement marketing effects and its three attributes and is demonstrated as the effect of product placement marketing with the parameters α , β , γ , δ .

$$P(v) = \alpha + \beta v + \gamma v^2 + \delta v^3$$

v is constructed from the distances of the three attributes.

$$v = \sqrt{(x - y)^2 + (x - z)^2 + (y - z)^2}$$

Based on Russell (1998), x is denoted as screen placement, y is denoted as script placement, and z is denoted as plot placement.

It is assumed that the value v is between 0 and a . Then, the probability density function (PDF), $f(v; \alpha, \beta, \gamma, \delta, a)$, can be derived as

$$\begin{aligned} f(v; \alpha, \beta, \gamma, \delta, a) &= (\alpha + \beta v + \gamma v^2 + \delta v^3) \left[\int_0^a (\alpha + \beta v + \gamma v^2 + \delta v^3) dv \right]^{-1} \\ &= (\alpha + \beta v + \gamma v^2 + \delta v^3) \left[a \left(\alpha + \frac{a\beta}{2} + \frac{a^2\gamma}{3} + \frac{a^3\delta}{4} \right) \right]^{-1} \end{aligned}$$

The cumulative distribution function (CDF) can be calculated by

$$\begin{aligned} F(v; \alpha, \beta, \gamma, \delta, a) &= P(V \leq v) = \int_0^v (\alpha + \beta v + \gamma v^2 + \delta v^3) \left[a \left(\alpha + \frac{a\beta}{2} + \frac{a^2\gamma}{3} + \frac{a^3\delta}{4} \right) \right]^{-1} dv \\ &= \left[a \left(\alpha + \frac{a\beta}{2} + \frac{a^2\gamma}{3} + \frac{a^3\delta}{4} \right) \right]^{-1} \int_0^v (\alpha + \beta v + \gamma v^2 + \delta v^3) dv \\ &= \left[a \left(\alpha + \frac{a\beta}{2} + \frac{a^2\gamma}{3} + \frac{a^3\delta}{4} \right) \right]^{-1} \left(v\alpha + \frac{v^2\beta}{2} + \frac{v^3\gamma}{3} + \frac{v^4\delta}{4} \right) \\ &= \frac{1}{a} \left(v\alpha + \frac{v^2\beta}{2} + \frac{v^3\gamma}{3} + \frac{v^4\delta}{4} \right) \left(\alpha + \frac{a\beta}{2} + \frac{a^2\gamma}{3} + \frac{a^3\delta}{4} \right)^{-1} \end{aligned}$$

And its expected value can also be calculated as

$$E(v) = \int_0^a v \cdot f(v; \alpha, \beta, \gamma, \delta, a) dv = \int_0^a \frac{v}{a} (\alpha + \beta v + \gamma v^2 + \delta v^3) \left(\alpha + \frac{a\beta}{2} + \frac{a^2\gamma}{3} + \frac{a^3\delta}{4} \right)^{-1} dv$$

The Empirical Data

The empirical data is collected by a survey of a fashion brand A, which uses YouTube videos and podcasts to promote the new series of products, including cosmetics, apparel, and handbags. There are 21 videos and 15 podcast programs used as a product placement strategy. In this marketing strategy plan, the brand collaborates with four YouTubers to produce a total of 21 videos, which include three types of placements: screen placement, script placement, and plot placement. Among these, 14 videos incorporate screen placement elements, 3 videos feature script placement, and 11 videos include both plot placement and script placement. All four YouTubers are beauty and fashion influencers, and the videos they released primarily focus on beauty styling and clothing coordination. In the podcast product placement strategy, there are a total of five podcasters who have produced 15 podcast episodes. Among them, 15 episodes incorporate script placement elements, while 9 episodes feature plot placement elements. Similarly, the podcast episodes hosted and produced by these five podcasters are also centered around beauty, fashion, and styling topics.

Out of the 21 YouTube videos associated with the new product launch, 8 were released one week prior to the launch, while the remaining 13 were released within two weeks following the product launch. Similarly, in the podcast segment, 3 episodes were released prior to the new product launch, while the remaining 12 episodes were released within one month after the product launch. The overall release schedule for the videos and podcast episodes spans from November 15, 2024, to December 31, 2024.

The effectiveness of the product placement marketing is assessed through a survey measuring the viewers' or listeners' experiences after engaging with the video or podcast content, including aspects such as satisfaction, interest, and entertainment value. The valid sample size consists of 2,658 viewers and listeners, of whom 2,002 are female, accounting for 78% of the total sample. This demographic aligns with the target consumer profile for this product series, as well as the videos and podcasts in which the product placements were incorporated, which primarily cater to a female audience. The sample's primary age group is 25-35 years, comprising 1,835 individuals (69%), followed by the 18-24 age group, with 823 individuals (31%). This age distribution aligns with the target demographic for both the product and the content of the videos and podcasts, which predominantly cater to this age range.

Results

The Parameter Estimation and Its Results

For the purpose to estimate the parameters, it is divided 2,658 sample into two parts, there are 40% (1063 data) sample size for estimation and another 60% (1595 data) for model calibration. The sample selection method was random, with 1,063 samples randomly drawn for parameter estimation, while the remaining unselected samples were used as the control group for model comparison.

The maximum likelihood estimation (MLE) is used to estimate the parameters of the proposed model. The results are shown in Table 1.

Table 1. The Results of Parameter Estimations

Parameters	α	β	γ	δ	a
Estimation Results	0.785	1.721	0.898	0.233	1.746

The Model Calibration

It is used 1595 data to model calibration. Theil U statistic (TUS) (Greene 1997; Grewal, Mehta, Kardes, 2004) is calculated as follows:

$$\sqrt{\frac{1/n \sum_{i=1}^n (S_i - \hat{S}_i)^2}{1/n \sum_{i=1}^n (S_i)^2}}$$

The results show TUS. = $\sqrt{\frac{2.2696 \times 10^{-4} \sum_{i=1}^{1595} (S_i - \hat{S}_i)^2}{2.2696 \times 10^{-4} \sum_{i=1}^{1595} (S_i)^2}}$ is 0.3354, which is an acceptable goodness-of-fit of the proposed model.

Discussion

The findings provide empirical support for the proposed relationship between product placement marketing effectiveness and the three placement attributes of screen, script, and plot. Based on Russell's (1998) three-dimensional framework, this study does not treat these three dimensions only as separate placement types. Instead, it represents them as interrelated attributes and measures their relationships through the distance among the three attributes. The results indicate a positive and concave relationship between the distance-based characteristics of the placement attributes and product placement marketing effectiveness.

The positive relationship suggests that the use and combination of the three placement attributes can contribute to audience responses to product placement. Screen placement provides visual exposure, script placement provides verbal or auditory information, and plot placement integrates the product into the content or

narrative. These attributes therefore represent different but complementary ways of presenting a product to an audience. The findings suggest that considering their relationships together may provide more information about product placement effectiveness than examining any single attribute independently.

The concave pattern is also important. It suggests that the relationship between placement attributes and marketing effectiveness is not simply proportional. As effectiveness-based value increases, the corresponding increase in effectiveness may gradually diminish. This finding implies that product placement effectiveness may depend on an appropriate combination or balance among screen, script, and plot placement rather than simply increasing the use of placement attributes. Thus, the results provide a quantitative interpretation of the importance of coordinating different placement forms within product placement content.

The empirical context further demonstrates the applicability of this perspective to contemporary digital media. The data include YouTube videos and podcast episodes in which different combinations of screen, script, and plot placement were employed. The results therefore suggest that the three-dimensional perspective can be applied to content in which product placement is integrated into both visual and audio-based media. Overall, the findings extend the application of Russell's framework by providing a distance-based approach for quantitatively examining the relationship among placement attributes and marketing effectiveness.

Conclusion and Recommendation

This study develops a quantitative model for predicting product placement marketing effectiveness based on three placement attributes: screen placement, script placement, and plot placement. By introducing the distance among these three attributes into the model, the study provides a quantitative approach to examine the relationship between different forms of product placement and marketing effectiveness. The model calibration produced a Theil U statistic of 0.3354, indicating an acceptable goodness of fit and providing empirical support for the proposed model. The main contribution of this study is the introduction of a distance-based perspective to the analysis of product placement attributes. Rather than evaluating screen, script, and plot placement independently, the proposed approach considers their relationships within a unified model. This provides an additional quantitative perspective for understanding how different placement attributes may jointly contribute to product placement marketing effectiveness.

From a managerial perspective, the findings suggest that marketing managers and content creators should consider the coordination of screen, script, and plot placement when developing product placement strategies. The objective should not simply be to increase the amount of product exposure, but to appropriately configure the three placement attributes according to the characteristics of the content and media platform. The proposed model may therefore serve as a reference for planning and evaluating alternative product placement configurations.

Several directions for future research are suggested. First, future studies can apply alternative probability density functions or stochastic model specifications to examine whether different model structures provide additional explanatory or predictive value. Second, empirical data from other industries, product categories, media platforms, and audience groups can be incorporated to examine the generalizability of the proposed model. Finally, future research may consider additional measures of product placement effectiveness to further examine the applicability of the distance-based approach across different marketing contexts.

This positively curved the irrelevant strategies to Different used.

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