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Influence of Packaging Finishing Techniques on Consumer Perception

ABSTRACT

Packaging finishing techniques are widely used to increase the visual appeal and perceived value of products. This study investigates the influence of foil stamping, blind embossing, and window cut-outs on consumer perception of packaging attractiveness. A total of 27 digital packaging prototypes representing three product categories (computer mouse, chocolate, and pharmaceutical products) were evaluated through a questionnaire conducted under controlled laboratory conditions. The results show that packaging enhanced with finishing techniques was consistently preferred over packaging containing only printed graphics. Window cut-outs achieved the highest attractiveness ratings for chocolate and pharmaceutical packaging, while respondents equally preferred window cut-outs and embossed designs for computer mouse packaging. In all product categories, packaging without additional finishing techniques received the lowest preference. The findings indicate that finishing techniques improve the perceived attractiveness of paper packaging and demonstrate that their effectiveness depends on the product category. The study provides practical guidance for selecting finishing techniques that enhance consumer perception and packaging appeal.

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KEY WORDS
Packaging design, packaging finishing, foil stamping, blind embossing, consumer perception, paper packaging

1. Introduction

Packaging has an important role not only in protecting and containing a product but also in communicating product characteristics and attracting consumer attention. In highly competitive retail environments, visual appearance can influence product evaluation before consumers have an opportunity to experience the product itself. Consequently, packaging design has become an important means of differentiating products and communicating perceived quality and value.

Previous studies have demonstrated that visual characteristics such as colour, shape, orientation, prominence and package structure can affect consumer attention and product evaluation (Orquin & Mueller Loose, 2013; Clement, Kristensen & Grønhaug, 2013). Aesthetic package design may also influence product choice and perceived value, indicating that visual appearance can contribute substantially to consumer response (Reimann et al., 2010). Previous research has also indicated that packaging incorporating added-value design elements may be perceived as more attractive by consumers (Malešević & Stančić, 2021).

In addition to printed graphics, packaging can be enhanced using different finishing techniques. Embossing creates a three-dimensional deformation of the substrate and can improve both the visual and tactile characteristics of packaging (Banjanin, 2018). Foil stamping additionally introduces metallic or coloured elements, while blind embossing produces relief without applying foil or ink. Such techniques are frequently used to visually distinguish packaging and enhance its perceived value. Another structural design element is a window cut-out that allows the consumer to see the product inside the package.

Product visibility can affect consumer perception and purchase behaviour, particularly in food packaging (Simmonds & Spence, 2017). However, the effectiveness of transparent elements may depend on the type of product and on other characteristics of the package. However, the effect of product visibility may depend on the product category and packaging context, as transparent packaging has also been associated with lower perceived product quality in some applications (Poslon, Kovačević & Brozović, 2021).

The aim of this study was therefore to investigate the influence of selected packaging finishing techniques and window cut-outs on perceived packaging attractiveness during the design stage. Foil stamping, blind embossing and window cut-outs were evaluated across three different product categories: a computer mouse, chocolate and a pharmaceutical product. Particular attention was given to whether packaging containing additional finishing elements would be preferred over packaging based primarily on printed graphics and whether these preferences differed among product categories.

2. Materials and methods

The study was based on digital packaging prototypes developed to simulate the appearance of selected finishing techniques before physical production. A total of 27 packaging designs were created in Adobe Photoshop and used as visual stimuli in the experiment.

The designs represented three different product categories: a computer mouse as a technology product, chocolate as a food product, and a pharmaceutical product.

For each product category, three basic packaging designs were developed and subsequently presented in three variants, resulting in nine stimuli per product category. The investigated variants included printed graphics without additional finishing, foil stamping, blind embossing and window cut-outs, as well as selected combinations of these elements. Silver foil was simulated for the computer mouse packaging, while gold foil was used for the chocolate and pharmaceutical packaging.

The designs were developed to resemble packaging commonly associated with the corresponding product categories while allowing the influence of finishing and structural elements to be evaluated. Digital prototypes were selected because they represent an important stage in contemporary packaging design and are frequently used to present packaging concepts prior to production.

The study included 53 participants aged between 19 and 36 years, predominantly students in graphic engineering and design, with approximately equal representation of male and female participants.

Given their educational background, the participants were generally familiar with graphic design and the finishing techniques represented in the stimuli.

The evaluation was conducted under controlled laboratory conditions using an EIZO CG241W 24-inch monitor. A questionnaire created in Google Forms was used to collect the responses. Participants evaluated the presented packaging alternatives through questions addressing design preference and attractiveness, as well as perceived quality, price and luxury.

Likert-type scales were used for several evaluation questions. For the purposes of the present study, the analysis primarily focuses on respondents' preference for different packaging designs and finishing variants.

A representative set of digital packaging stimuli developed for the chocolate product category is presented in Figure 1.



» **Figure 1:** *Representative set of digital packaging stimuli developed for the chocolate product category, illustrating the three basic designs and their corresponding finishing and structural variants*

3. Results

The results demonstrated a clear preference for packaging containing additional finishing or structural design elements compared with packaging based primarily on printed graphics.

Across the investigated product categories, designs incorporating window cut-outs or embossed elements were generally preferred, while variants without additional finishing were consistently among the least preferred alternatives.

For computer mouse packaging, both window cut-outs and embossing contributed positively to perceived attractiveness. In the first design group, the window cut-out and blind embossed variants were equally preferred, each being selected by 41.4% of respondents, whereas the printed version was selected by only 17.2%.

When foil stamping was incorporated into the design, the combination of foil stamping and blind embossing was selected by 42.6% of participants, while the combination of foil stamping and a window cut-out was selected by 33.3%.

For chocolate packaging, variants incorporating a window through which the product could be seen were consistently preferred across all three design groups. The window cut-out was selected by 64.8% of respondents in D1, while combinations of a window cut-out with foil stamping (D2) and blind embossing (D3) were preferred by 69.0% and 65.5% of respondents, respectively.

A similar tendency was observed for pharmaceutical packaging. When foil stamping was present, the variant combining foil stamping with a window cut-out was preferred by 58.5% of respondents. When blind embossing was used as the basic finishing treatment, the design combining embossing with a window was preferred by 63.8% of participants.

The evaluation of pharmaceutical packaging differed from the other product categories when broader product perceptions were considered. Participants generally provided more neutral evaluations regarding perceived product quality, price and luxury, although the packaging designs themselves received relatively high evaluations.

Overall, the results show that packaging incorporating finishing or structural design elements was more attractive to respondents than packaging without additional enhancement.

However, the degree of preference for individual techniques varied among the three investigated product categories.

Table 1

Most preferred packaging design variants for each design group across the investigated product categories

Product category	Design group	Most preferred design variant	Preference (%)
Computer mouse	D1	Window cut-out / Blind embossing	41.4 / 41.4
	D2	Foil stamping + blind embossing	42.6
	D3	Blind embossing	43.4
Chocolate	D1	Window cut-out	64.8
	D2	Foil stamping + window cut-out	69.0
	D3	Blind embossing + window cut-out	65.5
Pharmaceutical product	D1	Window cut-out	59.3
	D2	Foil stamping + window cut-out	58.5
	D3	Blind embossing + window cut-out	63.8

4. Discussion

The findings indicate that the influence of packaging finishing techniques and structural elements on consumer perception depends on the type of product being packaged. Although additional finishing generally increased packaging attractiveness, differences between product categories were observed in the relative preference for particular solutions.

The preference for a visible product was particularly pronounced for chocolate packaging. This finding is consistent with previous studies showing that visual exposure to food can affect consumer attention, desire and product evaluation (Wansink, 2004; Piqueras-Fiszman & Spence, 2011; Simmonds & Spence, 2017). The effectiveness of the window therefore appears to be related not only to its structural characteristics but also to the nature of the packaged product. The original study similarly identifies food as a particularly strong visual stimulus and relates the high preference for the chocolate window design to previous findings concerning food visibility.

Product visibility was also positively evaluated for pharmaceutical packaging, although participants were more neutral when evaluating perceived product quality, price and luxury. This may indicate that visual attractiveness alone has a more limited influence on broader judgments concerning pharmaceutical products. This more neutral evaluation may be related to unfamiliarity with the product and brand, as well as to factors such as perceived product effectiveness and brand

trust, which may limit the extent to which product quality is inferred solely from packaging appearance.

For computer mouse packaging, preferences were more evenly distributed between window-based and embossed solutions. In contrast to chocolate and pharmaceutical packaging, no single type of enhancement showed the same pronounced dominance. This suggests that the suitability of a particular finishing technique cannot be considered independently of the product category.

Overall, the comparison between product categories demonstrates that finishing techniques should be selected according to both the visual concept and the characteristics of the packaged product. Window cut-outs appear particularly effective when product visibility contributes directly to the visual evaluation of the contents, whereas embossing and foil stamping can provide an alternative means of increasing visual interest when direct product visibility is less important.

The findings also demonstrate the relevance of evaluating finishing techniques during the digital design stage. Although embossing and foil stamping possess tactile characteristics that cannot be fully represented on a screen, their simulated appearance was sufficient to influence participants' visual preferences. Digital prototypes may therefore provide useful preliminary information when selecting finishing solutions before physical prototypes are produced.

5. Conclusions

The study demonstrated that finishing and structural design techniques can influence the perceived attractiveness of packaging. Across the three investigated product categories, packaging incorporating additional finishing or window cut-outs was preferred to alternatives relying primarily on printed graphics.

Window cut-outs produced the strongest preference for chocolate and pharmaceutical packaging, while both window cut-outs and embossed elements were highly attractive in computer mouse packaging.

The results therefore indicate that the effectiveness of individual finishing techniques depends on the product category and that a single finishing solution cannot necessarily be considered equally effective for all types of packaging.

The findings also demonstrate that digital packaging prototypes can be used to evaluate consumer responses to finishing techniques during the design stage. This may allow designers to identify promising finishing solutions before proceeding to physical production.

A limitation of the study is that finishing techniques were represented through digital simulations and could therefore only be evaluated visually, without the tactile characteristics associated with physically produced packaging. In addition, the participant sample consisted primarily of young respondents with a background in graphic engineering and design. Future research should consequently include physically produced packaging, larger and more diverse consumer samples, and evaluation under actual retail conditions.

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