

APPLICATION OF PRINCIPLES OF KANSEI IN CERAMICS DESIGN

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1. ABSTRACT

The study of the emotional impressions caused by products is a topic of great interest both in research and in the business world. The techniques for quantifying the meanings and emotions of a product include Kansei Engineering, which explores the relationship between specific design features and the subjective impressions generated. This study analyses the influence of objective design parameters of ceramic floor tiles on the emotional perception that the product provokes. The participants in the study rated a set of subjective impressions related to eight variants of ceramic flooring, in which the design features related to colour, gloss and format were modified.

The results show that for the flooring studied, the assigned characteristics of colour and gloss influenced the meanings generated by the product, and in the case of the gloss there was even an influence on product preferences. These results are obviously highly variable depending on trends, and depend, among other things, on the moment in time, the location of the target market, or the specific type of product studied. However, their application can help to improve understanding of the reasons why certain variants of design are better accepted and have greater success in the market.

New contribution: Information on which design characteristics and attributes influence the subjective perceptions generated by the product is a valuable tool in the work of designers seeking to match their product with the preferences of customers in each market, for each season.

2. BACKGROUND

Information on the subjective impressions (meanings and emotions) provoked by a design and on their influence on preferences is essential from the earliest stages of a product's development [1]. Considering affective and emotional aspects helps to direct the design towards the preferences of potential customers, thereby increasing the options for the product in the market. This explains why the study of the customer's emotional experience is becoming increasingly important in product design in general [2, 3, 4] and in ceramic flooring in particular [5, 6, 7].

The search for the relationship between these subjective impressions generated by the product with specific design features or attributes (such as its colour or its format) leads to what is known as Kansei Engineering [8], whose principles have been applied in the study described below, in order to determine which combinations of attributes in the product generate specific meanings and preferences.

3. METHODOLOGY APPLIED

Conjoint Analysis principles have been applied, the main aim being to develop products tailored to the demands of consumers [9]. The product attributes chosen for study are *colour*, *gloss* and *format*, with 2 levels for each. Eight combinations (Table 1) are obtained by applying a complete orthogonal design.



Table 1. The eight flooring images resulting from orthogonal design.

The questionnaire, based on the semantic differential technique [10], was completed by 20 adult participants (14 women and 6 men), of whom 6 are decorators/interior designers and the rest having no professional occupation related to ceramic flooring. The ages were considered by ranges: younger than 25 (20%), from 26 to 39 (30%), from 40 to 59 (40%), and over 60 years of age (10%).

The survey was conducted in person, to ensure that all participants displayed the images in the same way. These were printed in A4 landscape format, and were arranged in front of the respondent in 2 rows and 4 columns. The order of presentation changed for each participant, according to a random order for 20 cases. Participants rated the 8 floorings comparatively on a 5-level Likert scale, for 7 adjectives referring to the flooring, as well as for their preference ("Like"/"Don't like"). These adjectives are shown in bold in the instructions for the questionnaire (Fig 1).

The Multivariate general linear model statistical technique was applied to the analysis. The dependent variables considered are the subjective impressions rated (the adjectives in Fig 1). The independent variables are the design features studied: *colour, gloss and format*. The purpose of the analysis was to detect whether there were significant differences in the valuations for each adjective, depending on the configuration of each image (the influence of the levels of each attribute associated with each image, individually or combined).

CUESTIONARIO de Ingeniería Afectiva enfocado a atributos de diseño (INAFAD)

Bienvenido al cuestionario INAFAD. Este cuestionario forma parte de una investigación que se está desarrollando en la Universitat Jaume I, y pretende determinar criterios de diseño, basándose en la Ingeniería Afectiva. Completarlo no le llevará más de 5-8 minutos.

El cuestionario consta de 3 partes:

1. INSTRUCCIONES: en la página actual se describe de forma sencilla cómo debe contestar a las preguntas.
2. VALORACIÓN DE LAS IMÁGENES: deberá contestar unas sencillas preguntas para cada una de las ocho imágenes que le van a mostrar.
3. DATOS GENERALES: Finalmente, unas breves preguntas generales para caracterizar a nuestros encuestados. Puede también expresar su opinión general. Muchas gracias por su colaboración.

INSTRUCCIONES

A continuación le mostrarán unas imágenes de pavimentos y le solicitarán su valoración. En concreto, se debe valorar mediante una escala en qué medida el pavimento le parece:

- **Sencillo y versátil**: es decir, si lo encuentra *sobrio, sereno, que no pasa de moda, práctico*, o bien *recargado y poco adaptable*.
- **Innovador y de diseño**: si le parece *moderno, vanguardista, original, atrevido, expresivo, fresco*, o bien *clásico, tradicional, poco original*.
- **Luminoso**: si aporta claridad y da sensación de amplitud, o bien resulta *apagado*.
- **Hogareño**, o si bien le parece para un uso *poco doméstico*.
- Con **aspecto de caro**, o bien *barato*.
- **Elegante**, distinguido, o bien de aspecto *vulgar*.
- **Natural**, o bien de sensación *artificial*.
- **"Me gusta el pavimento"**: imagine si le gustaría utilizarlo en su casa, si le haría sentirse satisfecho, o bien si *no le gusta*.

Para cada pregunta, conteste mediante una escala como en el siguiente ejemplo:

	2	1	0	1	2	
Luminoso						Apagado

	2	1	0	1	2
Si considera el pavimento muy luminoso →	X				
Si se considera el pavimento algo luminoso →		X			
Si no considera el pavimento ni luminoso ni apagado →			X		
Si considera el pavimento algo apagado →				X	
Si considera el pavimento muy apagado →					X

Fig. 1. First page of the questionnaire used in the survey.

4. RESULTS AND CONCLUSIONS

The model explains a significant part of the variation observed in the *Simple* variables (the model explains 50.9% of the variance), *Bright* (48.5%), *Homely* (12.9%), *Expensive-looking* (11%), *Natural* (36.1%) and *I like it* (9.2%).

By attributes, it confirms that *colour* causes significant differences in the valuation of the adjectives *Simple* and *Bright* (level of significance <0.01) and *Expensive-looking* and *Natural* (level of significance <0.05). Specifically, the choice of the light colour leads to ratings that are significantly higher in *Simple* and *Bright*, and lower in *Expensive-looking*, compared to those obtained by dark floorings. In terms of *Gloss*, significant differences were detected in *Simple*, *Homely*, *Expensive-looking*, *Natural* and *"I like it"* (level of significance <0.01) and in *Bright* (level of significance

<0.05). Bright floors are perceived as being more expensive, less simple, homely and natural, and are less liked than flooring with a matte finish. No significant differences in ratings were detected due to the *format* attribute or to the interaction between attributes.

The results show that for the flooring studied, the assigned characteristics of colour and gloss influenced the meanings generated by the product, and in the case of the gloss there was even an influence on product preferences. These results are obviously highly variable depending on the trends, and depend, among other things, on the moment in time, the location of the target market, or the specific type of product studied. However, their application can improve our understanding of the reasons why certain variants of design are better accepted and have greater success in the market, and it is therefore a valuable tool in the work of the designers, seeking to match the product with the preferences of customers in each market, for each season.

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