# 제품의 투명성이 사용자의 제품 평가와 선호도에 미치는 영향

## The Effect of Transparency in Product Design
## on Assessment of product attributes and Preference

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## 1. Introduction

In the field of user interface design, the visibility of system status is one of the important criteria to increase usability. (Nielsen, Molich, 1990)

When it comes to a product specifically, people interact with it not only in a graphical way but also through physical product itself using form and materials. Also in the real market, the exterior appearance is important determinant of new product performance (Bruce, Whitehead, 1988) and as a means of communicating information to consumers (Nussbaum, 1993)

Therefore a new concept would be suggested in this paper called 'transparency of product'; the characteristic that a product achieves the goal of visibility delivering the inside status, process or usage to user through its physical elements, not graphical ones. For example, it might be accomplished using transparent material, clearly divided parts of body and so on.

To support this idea, it would be explored how the transparency relates and affects on assessment of product and consequently on the preference of product. In this paper, it would be specifically focused on the characteristic of transparency using transparent material in product design.

## 2. Empirical study

The aim of the empirical study was to investigate the effect flow from transparency to preference to illustrate the effect of transparency.

The empirical study has 2 parts of procedure: data collection; constructing the relationship model using the statistical tool, PLS (Partial Least square) path modeling.

## 3. Data collection

Data collection was done by the means of e-mail survey. 34 Korean participants (18 male, 16 female, average age=23.9, SD=2.82) took part in the survey.

### 3.1. Stimuli

11 images of daily-life home appliance different in transparency level were used as the stimuli.

### 3.2. Questionnaires

The questionnaire consisted of 3 parts; demographic information, assessment of product attributes and preference for the product. The assessment of product attributes is based on the Hazzenzahl (2004)'s product quality assessment scales which covers the pragmatic quality and the hedonic quality of product. Each question was supposed to be answered in bipolar-word pairs on seven-point scales delivered in both English and Korean.

## 4. Constructing the relationship model

Data was analyzed using PLS path modeling, technically, the software 'visualPLS'.

### 4.1. Reliability and Validity

All common thresholds were met for construct reliability in accordance with the number of indicators, (Cronbach's $\alpha$ =0.855) and discriminate validity was satisfied as well showing an appropriate pattern of loadings.
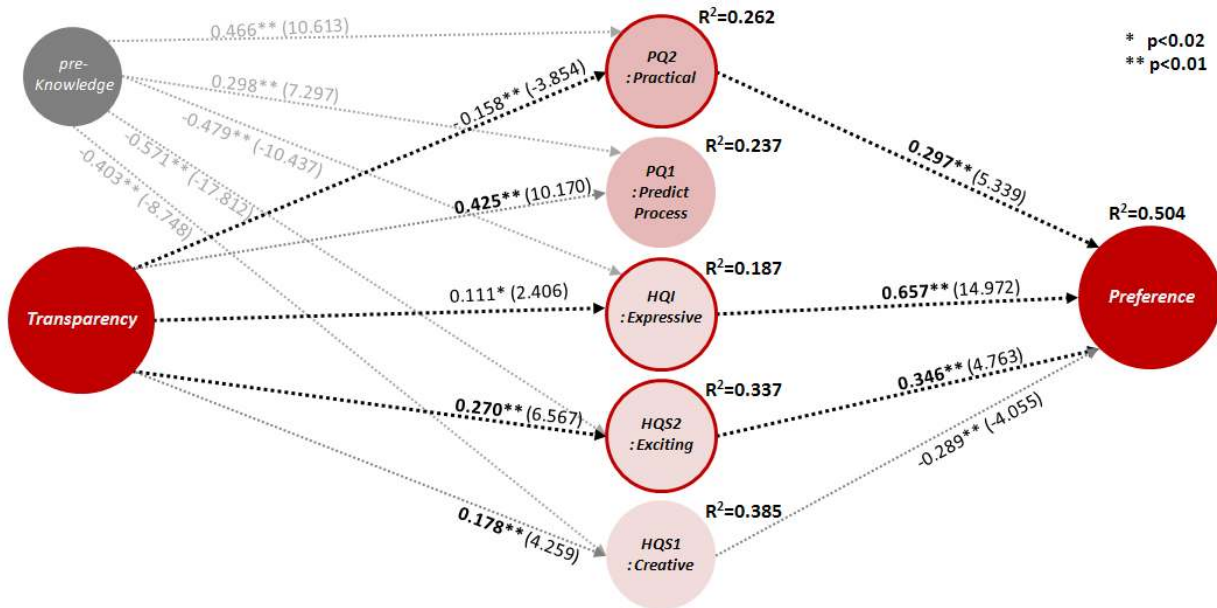
그림 1. Result: the structural model

## 4.2. Structural model of relationship

### 4.2.1. Between Transparency & Product Attributes

The transparency of product has influence on product attributes in different paths with different size of effect. The effect was largest on the pragmatic quality, especially predicting process (path coefficient r=0.425, p<0.01). It also had influence on another pragmatic attribute 'Practical' but in a negative way (r=−0.158, p<0.01). The Hedonic Qualities such as exciting and creative were moderately affected by the transparency (r=0.270, 0.178). However it does not affect Preference directly; the path between transparency and preference was rejected because of the insufficient t−value (t=0.857).

### 4.2.2. Between Product Attributes & Preference

Among the product attributes, the Hedonic Quality related to Identification (expressive: professional, valuable, and presentable) was the most important variable in the prediction of Preference(r=0.657). 'Exciting' which was another hedonic quality was the second (r=0.346, p<0.01). The influence of the Pragmatic Quality− 'Practical' − relatively weaker (r=0.297, $R^2$=0.504). On the contrary, predicting process does not contribute at all, in fact it is not significant.

## 5. Conclusion

The transparency affects on preference indirectly: it affects through the pragmatic attribute (practicalness), the hedonic quality of identification (expressiveness) and stimulation (excitement, creativeness). In other words, people feel more exciting; professional, valuable, presentable; less practical a little bit so that the preference increases.

The structural model may give insights to design practice: the transparency could be considered as the factor to improve preference. Also designers could control pragmatic or hedonic quality by adjusting the transparency, leading the preference.

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