

## STUDY ABOUT RELATIONSHIP BETWEEN OBSERVER AND PRODUCT DESIGN

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*ABSTRACT: This paper examines the observer's reactions in relation with industrial design, with or without additional information about the designer's intentions, while considering that the observer's actions are also influenced by their own experience. After presenting the current state of the field, three hypotheses were considered: H01: Observers assess the product design the same way, regardless of whether they receive information about the designer or not. H02: Observers estimate the price of the product the same way, regardless of whether they receive information about the designer or not. H03: Information about the designer and information about the manufacturing company have the same influence on the observer. Subsequently, questionnaires were presented to the participants in multiple stages. After validating the data by calculating the Cronbach Alpha coefficient, the Z-test was applied to test the hypotheses.*

### 1. Introduction:

Globalization has transformed the world, generating numerous effects. Competition is tougher than ever in all fields. There are many cases where a competitor from another continent has entered a company's traditional market with dramatic effects.

Investments in research are increasing, and technology is progressing at an accelerated pace. As a result, new products with incremental or radical improvements are entering the market at shorter intervals. Consequently, the market is flooded with similar products that have identical functions and parameter values within a very narrow range and are priced approximately the same. Clearly, consumers are faced with a dilemma: what criteria should they apply to choose the most suitable product for themselves and their families?

One strategy adopted by some companies is to invest in the industrial design of their products. Design investment involves developing industrial design departments, hiring famous designers, and conducting research on the aesthetics of the product. Not only the influences of shapes and colors on purchase intention and consumer satisfaction are studied, but deeper research is performed to explore product personality and even the influence on consumers when the product design is intentionally created by a designer to convey a specific meaning. It is true that research focusing on the latter aspect mentioned is relatively limited [1, 2, 3, 4, 5].

### 2. Current state

It is known that the industrial designer has certain intentions regarding how the designed product should be interpreted and used. These intentions are materialized through the language of the product (shapes, colours, textures, etc.). The consumer then interprets the product based on their own experience, the product's class, the context of use, the relationship between the product and its environment, and other factors. Crucial in this product-mediated relationship is the mutual awareness between the designer and the consumer, which can occur instantaneously or iteratively. [6].

The designer's intention to give product a specific meaning can be correctly perceived by the observer or not. If the intention is not correctly appreciated and the desired meaning by the designer is not accurately identified, then the observer will have difficulty in positioning the product and, ultimately, in deciding whether the product is suitable for them [7, 8, 9, 10, 11]. This case can be interpreted as a communication error between the designer and the observer, with consequences on the purchase intention. This happens because identifying the product meaning is the first step in a series of actions that lead to the purchasing decision [11]. It is important to highlight another aspect: while the designer has a lot of time (ranging from days to months) to create and interact with the product meaning through design, the observer has only a short period of time (seconds to minutes in fortunate cases) to attribute meaning to the product. This happens because the product will be seen in a store, a hypermarket, or an online store.

The designer and the observer do not have the same vocabulary and do not use the same visual code system (e.g., black = elegance, etc.). The designer interacts with a sample from the target market segment of the product and verifies if those codes they use are known to the targeted observers. However, the market segment is wide, and it is not certain that the sample they interact with is truly representative.

The observer is not a passive recipient of the designer's message indicating the product meaning. The observer has an active behaviour and attributes her/his own meaning to the product through mechanisms that are difficult to identify [12]. The observer is not a compliant "reader" of visual language codes. Moreover, people derive more satisfaction from reflecting on the essence of the product rather than simply perceiving its features [13].

The industrial designer is not the sole "sender" of the message conveyed through the code system. The producer also comes into play, as it is interested in transmitting information about brand and corporate identity. Technological aspects associated with the manufacturing process, safety-related legislative limitations, and other sources can alter the message, making it more challenging the decoding of designer's original message.

It is difficult to experimentally determine the extent to which observers correctly identify the intentions of designers regarding the meaning of a product. The main reason is that professional designers do not disclose their intentions. In an audacious attempt to compensate for this limitation, Khalaj and Pedgley [11] studied this proportion in the case of furniture intended for the society's upper classes. The research concluded that people correctly identified the meaning conveyed by the industrial designer in a proportion of 75%. It is challenging to evaluate whether this proportion is significant or not, but what is important to notice is that not everyone accurately identifies the product meaning.

Not always are observers aware of the designer's intentions, but when they are, they can deduce the designer's intentions from the visual, auditory, and other characteristics of the product. These intentions may include capturing attention, enhancing the brand image, creating product appeal, assigning meanings, and eliciting emotional responses such as satisfaction or delight [4]. Not only products intended for mature observers have been subject to studies, but children's toys have also been of interest to researchers regarding the influence of designer intentions [14].

Some experimental research has confirmed that people are positively influenced in their product perception and its aesthetics by acknowledging the designer's intention [15]. Other studies have indicated the same type of influence, but only in the case of elaborate design. Observers associate the contribution of a professional designer only with products featuring intricate and well-crafted designs, but they consider that an elaborate design may indicate not very correct design intentions, such as capturing attention and increasing sales [5]. In art field of, it has been

found that people appreciate an artwork more when they have information about the artist and, especially, when they learn about the thoughts expressed artist about their work [16].

However, it is noted that there are few studies that confirm the hypothesis that knowledge of the designer's intentions and awareness of the designer's projected character enhance the positive evaluation of industrial design.

### 3. Experiment design

The experiment was designed based on the working hypotheses:

*H01: Observers assess the product industrial design the same way, regardless of whether they receive information about the designer or not.*

*H02: Observers estimate the product price the same way, regardless of whether they receive information about the designer or not.*

The experiment was designed to have two stages. The first stage involved self-evaluation of participants' opinions regarding the influence of information about the designer and the manufacturing company on their purchase intentions. The second stage involved participants assessing the design and acceptable price of certain products. In the second stage, two categories of participants were involved: some were provided only with images of the products and a price range (first phase), while others received additional information about designer and product (second phase).

In the first stage, a questionnaire was used where responses were given on a 7-point Likert scale (1 - Yes; 7 - No). The questions in the first stage were as follows:

1. If you were to learn the name of the product designer and some information about her/his life and work, would you purchase that particular product over another similar?
2. If you were to learn how the designer of the product was inspired or motivated to design that particular product, would you purchase that product over another similar one? (You may not know this, but sometimes the stories behind products are worthy of being chapters in a novel.)
3. If you were to learn about the intentions and statements of the designer regarding her/his product, would you purchase that product over another similar one?
4. If you were to learn about the mission and strategy of the manufacturing company, would you purchase that product over another similar one?
5. If you were to learn about the quality assurance system in the manufacturing company, would you purchase that product over another similar one?
6. If you were to learn about the specific actions taken by the company in the field of corporate social responsibility (supporting social causes, environmental protection, fair treatment of employees, etc.), would you purchase that product over another similar one?
7. If you were to learn specific information about the company's research efforts aimed at ensuring a better future for both consumers and its employees, would you purchase that product over another similar one?

In the second stage, all participants evaluated three remarkable design products presented in Figures 1 - 3. The questions for this stage were as follows:

1. Please rate the aesthetic value of the product. (Likert scale: 1 - Ugly; 7 - Beautiful)
2. Knowing that similar products are sold at prices between  $x$  and  $y$  euros, how much are you willing to pay to purchase this product?



Fig. 1. Philippe Starck – The citrus squeezer "Juicy Salif"



Fig. 2. Ferruccio Laviani – The lamp „Bourgie”



Fig. 3. Eero Aarnio – The chair „Pastille”

#### 4. The experimental results

The experiment was conducted in the first stage with 309 participants (167 females and 142 males). All participants were students enrolled in a major technical university in Romania. The participants had a basic background in product aesthetics. The accuracy of the results was tested using the Z-score. No Z-score was outside the range of [-3; +3], so no data sets were eliminated. The Z-score ranged from -2.95 to 1.83. The data reliability was tested using Cronbach's alpha coefficient. The calculated value for the complete data set was  $\alpha = 0.87$ , indicating appropriate data reliability.

The experimental results of the first stage are presented in Table 1. It can be observed that the average scores given to information about the designer are significantly lower than those given to information about the company. Furthermore, the information about the company's mission was evaluated at a similar level as the information about the designer, suggesting that these pieces of information are perceived as subjective and not influencing the performance and qualities of the products manufactured by the company.

**Table 1. The influence of information about the designer and the manufacturing company on purchase intention**

Information	Media notelor [1 – 7]
Designer name and their activity	4.14
The inspiration behind the creation of the product's design	4.54
The intentions and statements of the designer regarding the product	4.29
The mission of the manufacturing company	4.16
Quality assurance within the company	5.04
Corporate social responsibility	5.44
Research within the company	5.28

Given that the difference of approximately 1 point between the average scores associated with the designer and the manufacturing company may be statistically insignificant, the Z-test was applied for the following null hypothesis:

*H03: Information about the designer and information about the manufacturing company have the same influence on the observer.*

The result is  $z(308) = 5.78 > 1.96 = z_{critic}$ , and  $p = 7.14 \times 10^{-9}$ . The null hypothesis *H03* should be rejected based on both criteria.

The experiment was conducted in the second stage (first/second phase) with 185/149 participants (99/94 females and 86/55 males). All participants were students enrolled in a major technical university in Romania. The participants had a basic background in product aesthetics. The accuracy of the results was tested using the Z score. No Z scores were outside the range of [-3; +3], so no data sets were eliminated. The Z score (for both phases) ranged from -2.56 to 1.96. The reliability of the data was tested using the Cronbach's alpha coefficient. The calculated value for the complete dataset was  $\alpha = 0.58$ , indicating borderline data reliability.

The results of the first phase of the second stage are presented in Table 2. It is worth noting that the price ranges indicated for the three products were: 50 - 150 euros (juicer); 300 - 400 euros (lamp); and 1000 - 1500 euros (chair). Without having a direct connection to the purpose of the experiment, it is observed that the products worthy of being mentioned in textbooks and designed by famous designers were evaluated at an average level (with a score of 4 being the mean on the 7-point Likert scale).

**Table 2. The evaluation of the design and price based solely on the product image is shown.**

	Juice Squeezer	Lamp	Chair
The aesthetic value	4.24	4.62	4.30
The accepted price range [euro]	68.23	325.23	1112.68

**Table 3. Assessment of industrial design and price based on the product image and information about the designer.**

	Juice Squeezer	Lamp	Chair
The aesthetic value	4.22	4.88	4.87
The accepted price range [euro]	68.34	328.54	1129.47

**Table 4. Differences in evaluations**

	Juice Squeezer	Lamp	Chair
The aesthetic value	-0.02	0.26	0.57
The accepted price range [euro]	-0.11	3.31	16.79

The results of the second phase of the second stage are presented in Table 3. More significant are the differences between the values, which are indicated in Table 4. Not only are the differences small, but in the case of the squeezer, they are negative. The z-test was applied to all cases, and the results are presented in Table 5. (The value of 0.004 is not significantly smaller than 0.05.) Both hypotheses  $H01$  and  $H02$  could not be rejected, which means that obtaining information about the designer and the design process does not positively influence the appreciation of the product.

**Table 5. The results of applying the z-test**

	$z = 1.96$	$p < 0.05$	The difference is
Variation in the assessment of the design (juicer)	0.08	0.93	insignificant
Variation in the assessment of the design (lamp)	-1.33	0.18	insignificant
Variation in the assessment of the design (chair)	-2.85	0.004	insignificant
Variation in the assessment of the accepted price (juicer)	-0.04	0.97	insignificant
Variation in the assessment of the accepted price (lamp)	-0.76	0.45	insignificant
Variation in the assessment of the accepted price (chair)	-0.91	0.36	insignificant

## 5. Conclusions

The results of the study indicated that the hypotheses *H01*: „*Observers assess the product design the same way, regardless of whether they receive information about the designer or not.*” and *H02*: „*Observers estimate the price of the product the same way, regardless of whether they receive information about the designer or not.*” could not be rejected. Therefore, the information about the designer and the creative process does not positively influence the appreciation of the product among the participants in this study. Hypothesis *H03*: „*Information about the designer and information about the manufacturing company have the same influence on the observer.*” was rejected. This means that in advertising, emphasis should be placed on information about the manufacturing company.

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