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Published in:

Proceedings of the 19th International Conference on Engineering Design (ICED13) : Design For Harmonies

Publication date:

2013

[Link back to DTU Orbit](#)

Citation (APA):

Perez Mata, M., Ahmed-Kristensen, S., & Yanagisawa, H. (2013). Perception of Aesthetics in Consumer Products. In *Proceedings of the 19th International Conference on Engineering Design (ICED13) : Design For Harmonies* (Vol. 7, pp. 527-536). Design Society.

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PERCEPTION OF AESTHETICS IN CONSUMER PRODUCTS

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ABSTRACT

In today's highly saturated consumer markets, competition among products is high. Emotional design, kansei engineering and aesthetics are tools increasingly used to make products stand out from their competitors. This study investigates how the desire to own a product is related to the perceptions and aesthetics of the product. Surveys were conducted with 97 participants to gather their perceptions of 11 vases. Findings from the case study indicate that there exist significant relations between the desire to own a product and how the product is perceived; and also between the perceptions and the parameters of the vases. The results from this study are a set of design guidelines for creating products, in this case vases, targeting desire for ownership and evoking specific perceptions. The results are specific to vases or similar product categories although the method can be applied to other product categories.

Keywords: emotional design, kansei engineering, perception

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1 INTRODUCTION

In today's highly saturated markets, competition among products belonging to the same category is high. Many products are now released with similar functionalities and the only way to stand out from competitors is through offering the consumer added value in the sense of aesthetic appeal or emotional attachment. Aesthetics within the context of design research stands for the features of a product that create its appearance and have the capacity to generate immediate responses during the experience of an object through the sensory system (Lawson, 1983). The response to aesthetics is rapid, involuntary and can be biased positively or negatively (Ulrich, 2006). The appearance features of products include materials, colour, proportion, ornamentation, shape, size and reflectivity (Brunel and Kumar, 2007) and in the right combination can provide pleasure or delight from the sensory system regarding a physical object (Hekkert, 2006). Aesthetics also give a sense of quality to the product because attractive things do not occur at random, it takes time to make them look appealing (Ulrich, 2006).

According to David Myers (2004), emotions are the mental experience of an individual when it interacts with internal (physical) and external (environment) stimuli. However, emotions should not be confused with perceptions. Emotions are evaluations of external stimuli based on physical body responses (eg. happy, sad or angry) (Myers, 2004) while perceptions are what we notice from products (eg. beautiful, static or aggressive) (Goldman, 1995).

It is of interest for many designers to understand how shape and form of products evoke desired perceptions. Ahmed and Boelskifte (2006) found that what designers and users perceive from products can vary. Understanding the relation between the appearance and the perception could lead to the development of products with enhanced aesthetic appeal that would stand out of the competitors and achieve higher sales. Finding relations between perceptions and aesthetic parameters is considered the key to designing appealing products that people want to own. Since it is well known that the final purpose of people buying objects is because people want to feel pleasure from owning them (Jordan, 2000), tools to design with the consumers in mind have increased and now are being implemented in industry.

Different approaches have been developed to relate adjectives, representing perceptions, and aesthetic parameters of products. Following the analogy of communication, which defends that first it is necessary to understand how shape invokes feeling to later be able to apply the knowledge to systematically design aesthetically pleasing products, we find Van Bremen *et al.* (1998). They explain that shape, composition and physical attributes (colour, texture and materials) are the most influencing parameters of the aesthetics of a product. Building on that approach, Achiche and Ahmed-Kristensen (2011) proposed a method based on the Gestalt rules to analyse shapes. Measuring different geometric parameters from the objects and relating them with if-then rules, it was possible to explain a series of adjectives. Hsiao and Chen (2006) also worked in that direction and they were able to identify common relations between shape elements and emotions across three product categories (cars, sofas and kettles). They defined shape elements (eg. Line) and shape manipulators (eg. straight, curved, straight and curved). Schütte and Eklund (2005) came up with a series of design rules that state that it is the combination of properties what gives a certain impression. Osborn *et al.* (2009) use the preferences of consumers regarding products to design new objects targeting the consumer perception. Another approach to relate shape and aesthetics involves first defining the target feeling desired from a product and then, either participants (consumers) evaluate a product with a computerized method using evolutionary techniques until the object matches the consumer expectations (Yanagisawa and Fukuda, 2005) or designers modify the factors identified as having significant influence to get closer to the target feeling specified from the beginning (Lai *et al.*, 2005).

This paper describes a study based upon the analogy of communication.

2 RESEARCH AIM AND MOTIVATION

The aim of this research was to investigate the relationship between the desire to own products and the perceptions evoked within participants with the purpose of introducing more competitive products in the market. Hence, it was necessary to identify which aspects of the form of a product evoke feelings or perceptions on consumers and what relations existed between perceptions felt from a product and the desire to own it.

The case study is based on concepts of vases from a Danish design-driven company based on the Scandinavian design philosophy. The reason for selecting vases was that they are products with simple functionality and high aesthetical appeal.

Three sub-aims are presented in this study:

1. Ownership + perception: Investigation of the relationship between the desire to own products and adjectives describing the perceptions. This aims to understand what people feel when they want to own a product.
2. Adjectives + Product form: Investigation of the relationship between adjectives describing perceptions and the aesthetic parameters from products to understand the product characteristics that influence each perception or combination of perceptions.
3. Ownership + Product form: Comparison of the results from both previous steps to understand the relationship between ownership and aesthetic parameters of products.

The first step has not been looked upon before and is therefore new for this study. It is of interest for marketing and useful to obtain guidelines for the design brief. The second step has however been successfully investigated and applied before (Schütte and Eklund, 2005; Hsiao and Chen, 2006; Achiche and Ahmed-Kristensen, 2011) and is meant to show designers how to achieve specific perceptions. It was believed that some relations would become apparent between the products analysed and the perceptions identified. The combination of the results from both steps was expected to provide design rules or guidelines that could be used to assess ownership and perceptions based on aesthetics. These design rules could be used by designers when presented with the task of creating the external appearance or aesthetics of a product.

3 METHODOLOGY

3.1 Data collection

A survey with 11 vases was conducted through an online social network. The vases were produced by relatively well known designers (predominantly Scandinavian) in the form of concepts. The briefing given to the designers was to create an organic and feminine vase. Designers made several proposals and the company was in charge of selecting which one would be manufactured and sold.

A total of 97 participants undertook the survey which took between 15 to 20 min. to complete. 71 participants answered all 126 questions (which were in the form of bullet options) and these are analysed in this paper. In the survey, participants were asked to give information about their background: country, age, gender, if they had design background and style. In the style question they were asked to choose between some options (Scandinavian, Minimalistic, Romantic/French inspired, Country/Traditional and others), which are the styles defined by the company. Then they were asked to rate 11 vase concepts (see Figure 1) from the company against a group of ten selected pairs of opposite adjectives representing perceptions from products (see Table 1). The adjectives were developed based on prior work by one of the authors (Achiche and Ahmed, 2008).



Figure 1. Images of the 11 vase concepts

Table 1. List of the ten selected opposite adjective pairs used to evaluate the vases

1. Ugly / Beautiful	6. Clumsy / Elegant
2. Aggressive / Passive	7. Feminine / Masculine
3. Cheap / Expensive	8. Youthful / Mature
4. Common / Uncommon	9. Dynamic / Static
5. Dull / Exciting	10. Organic / Artificial

Semantic Differential scales (SD scales) (Osgood *et al.*, 1957) with seven levels were used to extract the emotional information from participants regarding the vases (see Table 2).

Table 2. Example of a SD scale with seven levels for adjective pair ugly / beautiful

Very Ugly	Quite Ugly	Slightly Ugly	Neutral	Slightly Beautiful	Quite Beautiful	Very Beautiful
-3	-2	-1	0	1	2	3

An additional question regarding the ownership of the vases was introduced after the emotional evaluation with the purpose of using it to find relations between the emotional description of products and the will of people to own them or not. The ownership question is based on the intention of participants to own a product which can actually differ from actual purchase.

3.2 Data segmentation: Ownership dendrogram

A Cluster Analysis (CA) was performed on the ownership value to sort the participants into groups with similar replies to the ownership of the 11 vase concepts. The purpose was to ease the identification of relations between ownership and perceptions. The clustering method used for analysing the semantic diversity of ‘ownership’ is based on Yanagisawa’s work (Yanagisawa, 2011). The result of the grouping can be seen in Figure 2. The smaller the distance between participants in the graph, the closer they were to each other in terms of replies to the ownership of the 11 vases. The higher the distance, the more different they were from each other. The ownership values were (-1 for don’t want to own, 0 for maybe want to own and 1 for want to own).

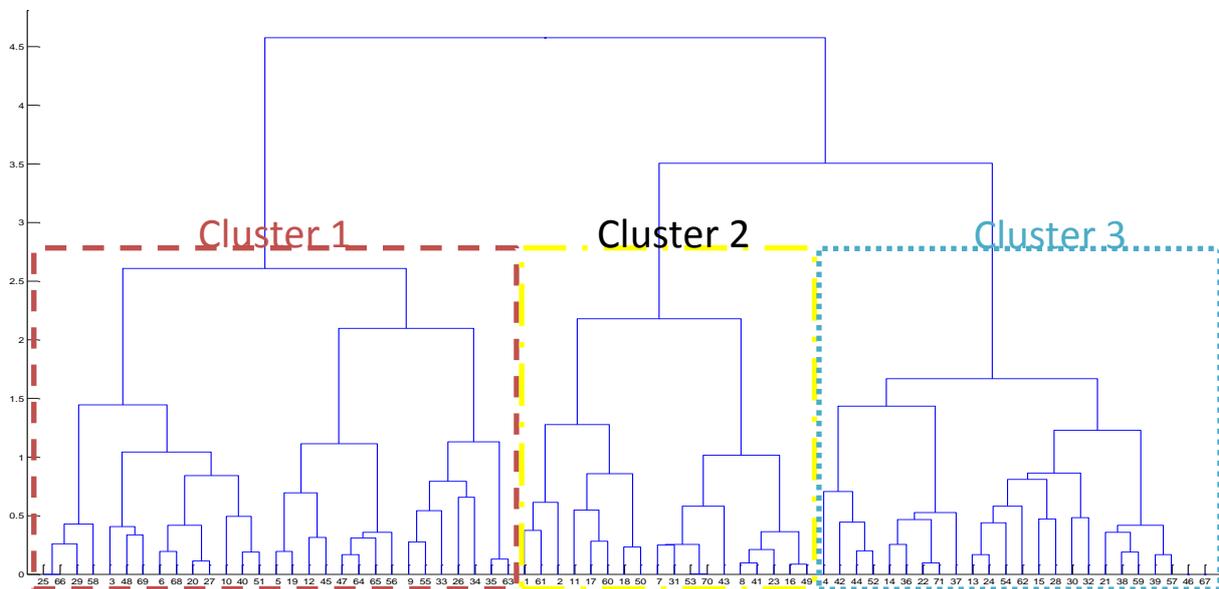


Figure 2. Dendrogram graph from Cluster analysis based on ownership information from the 11 vases. Horizontal axis = the participants. Vertical axis = distance between the participants

Three groups with similar distances could be identified in the dendrogram tree. Therefore, three clusters were created. Cluster one had 29 participants, cluster two had 18 participants and cluster three had 24 participants.

3.3 Data analysis

The analysis of the data was divided into two main sections (see Figure 3). The first section involved identifying relations between ownership and perceptions. The second section involved identifying relations between perceptions and aesthetic parameters from the product form.

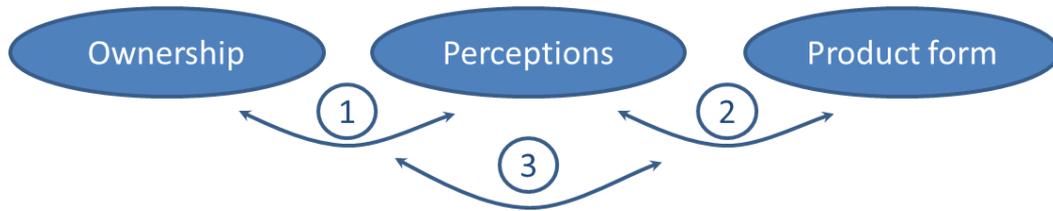


Figure 3. Data Analysis steps

A three steps data analysis was employed:

1. A series of statistical methods such as Correlation Coefficient Analysis (CCA), Principal Component Analysis (PCA) and a Factor Analysis (FA) were performed to each of the clusters with the intention of finding significant relations between the ownership of a vase and the adjectives selected to describe it.
2. The study of the relationships between the adjectives and the aesthetic parameters from the product form was addressed by identifying a series of shape, finish and colour parameters describing the vases that were later related to the adjectives with the use of Correlation Coefficient Analysis (CCA) and Multiple Regression Analysis (MRA).
3. Finally, through comparing the outcomes of step one and two, it was possible to relate ownership of the vases and the aesthetic parameters.

Each statistical method provided different insight into the relationships. CCA was used to find significant correlations between two variables (ownership and adjectives; adjectives and aesthetic parameters). PCA assumed that a Principal Component (PC) is a combination of adjectives while FA assumed that adjectives are combinations of latent factors. MRA was used to find which combinations of aesthetic parameters could be perceived as an adjective describing the vases.

The output of these analyses was expected to be a series of design rules or guidelines that would aid designers to generate new vase concepts with a particular perception as a target. It was also expected to obtain rules stating how the appearance of vases should be for people to want to own them.

4 RESULTS

The background information from the surveyed participants can be summarized as: the majority of participants were mainly from Denmark (55%) and showed no big difference between the number of people that had design background from those that didn't (from 47% to 52%). The majority had between 20 to 39 years and there were more males than females (62% versus 38%). The predominant styles were Scandinavian and Minimalistic while 'other style' was also rated highly.

4.1 Wanted and unwanted vases

From CA, the wanted and unwanted products from each of the three clusters were compared and it became clear that some products were unwanted for all three clusters, some products were maybe wanted for at least two clusters, no product was commonly wanted and some vases were unwanted or maybe wanted depending on the cluster (see Table 3). It was very clear to see what participants didn't want. The common unwanted products across clusters are marked in bold in Table 3.

Table 3. Comparison table for the 11 vases against the three ownership values

	Don't want to own vases	Maybe want to own vases	Want to own vases
Cluster 1	1, 3, 6, 7, 9 and 10	2, 4, 5 and 8	11
Cluster 2	1, 3, 4, 5, 6, 7, 9 and 10	2 and 11	8
Cluster 3	1, 3, 5, 6, 7 and 10	2, 4, 8, 9 and 11	-

4.2 Relation between desire to own and adjectives

Three statistical analyses were carried out to relate the desire to own and the adjectives describing perceptions from the vases. From the Correlation Coefficient Analysis (CCA) it was concluded that

significant correlations existed between ownership and the adjectives beautiful, expensive and elegant for all three clusters (marked in grey in Table 4). Two other adjectives, exciting and common, were also found to be significantly related to ownership although this was only true for two out of three clusters. Dynamic was significant just for one cluster. The negative sign of r indicates that the first adjective of the pair is positively related to ownership.

Table 4. Results for the CCA for the three clusters (only those with $p < 0,05$ are shown, i.e. significant).

Adjectives related to ownership for cluster 1	Correlation coefficient (r)	p value	r2	% explained
Ugly / Beautiful	0,948	0,001	0,899	89,91
Cheap / Expensive	0,760	0,006	0,578	57,78
Dull / Exciting	0,937	0,001	0,879	87,87
Clumsy / Elegant	0,942	0,001	0,887	88,67
Dynamic / Static	-0,683	0,020	0,467	46,69
Adjectives related to ownership for cluster 2	Correlation coefficient (r)	p value	r2	% explained
Ugly / Beautiful	0,975	0,001	0,951	95,10
Cheap / Expensive	0,897	0,001	0,804	80,45
Common / Uncommon	-0,885	0,001	0,782	78,25
Dull / Exciting	0,791	0,004	0,625	62,52
Clumsy / Elegant	0,931	0,001	0,867	86,74
Adjectives related to ownership for cluster 3	Correlation coefficient (r)	p value	r2	% explained
Ugly / Beautiful	0,988	0,001	0,976	97,58
Cheap / Expensive	0,606	0,048	0,367	36,73
Common / Uncommon	-0,837	0,001	0,701	70,06
Clumsy / Elegant	0,957	0,001	0,915	91,52

From the Principal Component Analysis (PCA), beautiful and feminine were found to be common adjectives for the first Principal Component (PC) across clusters; elegant was only shared by two clusters. On the other hand, artificial and elegant were found to be common for two clusters in Principal Component two. Another output of the analysis was the principal component space shown in Figure 4. That graph gives an overview on how the vases are perceived, i.e. the vases represented close to each other in the graph are perceived similarly.

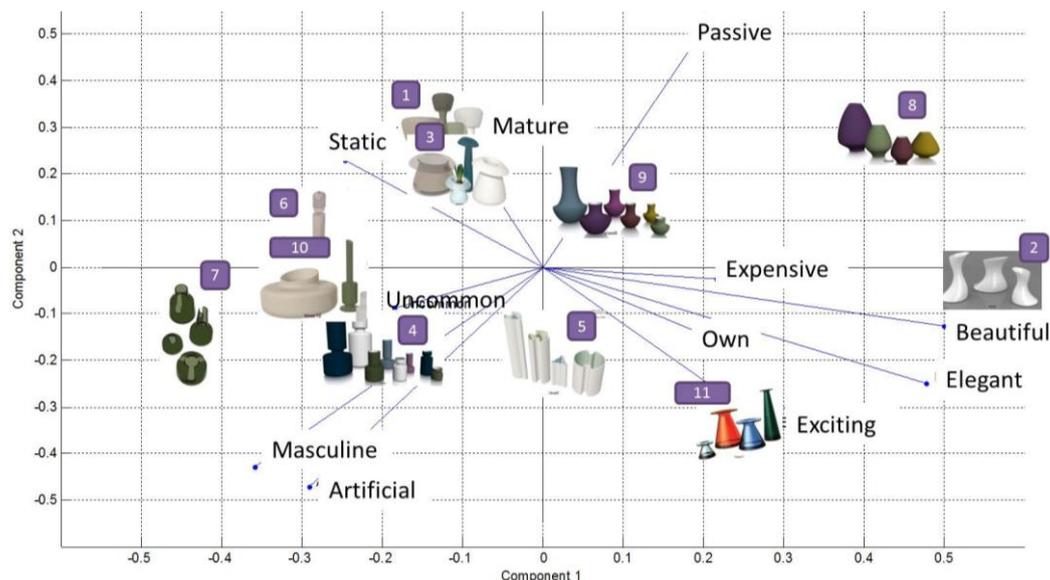


Figure 4. PC space for the first cluster. Horizontal axis= PC1, vertical axis=PC2.

In Factor Analysis (FA), from the factor space and the factor scores it was possible to identify which adjectives moved together and were therefore related. The adjectives that moved together with

ownership were particularly interesting: beautiful and elegant moved together for the three clusters while expensive and exciting were shared by two of the clusters. Adjectives aggressive, masculine and artificial were also found to be moving together for the three clusters. And mature was an independent adjective. The three groups of adjectives moved independently from each other (See Table 5). Factors with an eigenvalue above one provide more information than the variables in the data set and were kept. The cumulative % shows the amount of information accounted for by the factors of each cluster. Important results are marked in grey and only the second adjective of the pair is represented in the table. The negative sign indicates that the relationship is with the first adjective of the pair.

Table 5. Summary of results from the FA of the three clusters.

Factor	Loadings for cluster 1			Loadings for cluster 2			Loadings for cluster 3		
	1	2	3	1	2	3	1	2	3
Own	0,980	-0,089	-0,068	0,922	0,302	0,200	0,994	-0,061	-0,015
Beautiful	0,922	-0,315	-0,179	0,951	0,300	0,034	0,983	-0,170	0,018
Passive	-0,039	-0,970	-0,165	0,129	0,847	0,043	0,264	-0,819	-0,310
Expensive	0,769	-0,410	0,162	0,766	0,530	0,097	0,018	0,430	0,161
Uncommon	-0,490	0,251	0,831	-0,837	-0,114	-0,366	-0,825	0,299	0,391
Exciting	0,977	0,084	0,184	0,859	0,174	-0,345	0,519	0,128	0,836
Elegant	0,950	-0,199	-0,085	0,977	0,114	0,037	0,961	-0,084	0,159
Masculine	-0,306	0,945	0,071	-0,367	-0,817	-0,023	-0,287	0,897	0,025
Mature	-0,508	-0,084	-0,736	0,096	0,060	0,991	0,488	-0,246	-0,787
Artificial	-0,179	0,933	0,090	-0,159	-0,985	-0,026	-0,019	0,923	-0,059
Significant tests									
Eigenvalues	5.639	2.693	1.186	6.186	1.798	1.261	4.948	2.554	1.328
Cumulative %	93,50%			90,90%			85,60%		

From the above results, it was clear that relations existed among some of the adjectives and these included associations with ownership. The adjectives beautiful, elegant, expensive and exciting were among the most commonly mentioned adjectives that showed relations with ownership in different analyses and hence were determining adjectives to investigate the links between ownership and aesthetic parameters.

4.3 Linking adjectives and aesthetics

From previous studies within the area (Van Bremen *et al.*, 1998; Hsiao and Chen, 2006; Achiche and Ahmed-Kristensen, 2011) it was possible to define which aesthetic parameters were interesting to consider for the study of the vases. Some were taken from those studies while others were originally considered for this study. The aesthetic parameters considered included shape, finish and colour parameters and were measured and converted into ratios to ease the comparison with adjectives. Table 6 shows the procedure used to calculate the ratios of the aesthetic parameters so it was possible to operate with them. The results are expressed in percentage.

Table 6. Ratios formulas for the aesthetic parameters considered for the vases

<p>Lines Curves Ratio (LCR)</p> $LCR = \frac{NL}{NL + NC} 100 \quad (1)$ <p>NL = nr of lines NC = nr of curves</p>	<p>Acute Obtuse Angle Ratio (AOR)</p> $AOR = \frac{NAA}{NAA + NOA} 100 \quad (2)$ <p>NAA = nr of acute angles NOA = nr of obtuse angles</p>	<p>Curved Sharp Corner Ratio (CSCR)</p> $CSCR = \frac{NRC}{NRC + NSC} 100 \quad (3)$ <p>NRC = nr of round corners NSC = nr of sharp corners</p>
<p>Regularity Level (RL)</p> $RL = \frac{\sum_i R_i}{j} 100 \quad (4)$ <p>R = nr of symmetry planes per vase j = nr of total symmetry planes (j=3)</p>	<p>High Low Gravity Point Ratio (HLGPR)</p> $HLGP = \frac{HGP}{HGP + LGP} 100 \quad (5)$ <p>HGP = high gravity point LGP = low gravity point</p>	<p>Complexity level (CPL)</p> $CPL = \frac{nr.of.modules}{1vase} 100 \quad (6)$ <p>If CPL = 2 then the vase is complex (100% CPL) If CPL = 1 then the vase is simple (0% CPL)</p>

Vertical Horizontal Aspect Ratio (VHR) $VHR = \frac{NVV}{NVV + NHV} 100 \quad (7)$ NVV = nr of vertical vases NHV = nr of horizontal vases	Brilliance Dull Ratio (BDR) $BDR = \frac{NBV}{NBV + NDV} 100 \quad (8)$ NBV = nr of brilliant vases NDV = nr of dull vases	Transparent Solid Ratio (TSR) $TSR = \frac{NTV}{NTV + NSV} 100 \quad (9)$ NTV = nr of transparent vases NSV = nr of solid vases
Cold Warm ratio (CWR) $CWR = \frac{C}{C + W} 100 \quad (10)$ C = cold colour W = warm colour	Low High Brightness ratio (LHBR) $LHBR = \frac{LB}{LB + HB} 100 \quad (11)$ LB = low brightness HB = high brightness	Low High Chroma ratio (LHCR) $LHCR = \frac{LC}{LC + HC} 100 \quad (12)$ LC = low chroma HC = high chroma

A Correlation Coefficient Analysis (CCA) and a Multiple Regression Analysis (MRA) were performed to detect what aesthetic parameters affect each of the different adjectives and also what combination of aesthetic parameters generated a perception if any. Results from the CCA (see Table 7) were a series of design rules linking individual adjectives to several aesthetic parameters. They allow designers to generate vases with a target perception in mind. For example, for a vase to be considered beautiful, designers should try to generate a shape with more curves than lines, simple or vertical. Only the second adjective of the pair is represented in the table.

Table 7. Results summary from CCA between adjectives and aesthetic parameters (only those with $p < 0,05$ are shown, i.e. significant)

Adjectives	Shape parameter	Corr. Coeff. (r)	p value	r2	% explained
Beautiful	Lines Curves Ratio (LCR)	-0,633	0,037	0,401	40,09
	Complexity Level (CPL)	-0,743	0,009	0,551	55,14
	Vertical Horizontal Aspect Ratio (VHR)	0,640	0,034	0,409	40,90
Passive	Lines Curves Ratio (LCR)	-0,850	0,001	0,723	72,28
Expensive	Lines Curves Ratio (LCR)	-0,646	0,032	0,417	41,72
	Complexity Level (CPL)	-0,679	0,022	0,461	46,08
	Vertical Horizontal Aspect Ratio (VHR)	0,715	0,013	0,511	51,05
Uncommon	-				
Exciting	Complexity Level (CPL)	-0,685	0,020	0,469	46,93
	Vertical Horizontal Aspect Ratio (VHR)	0,621	0,042	0,385	38,54
Elegant	Complexity Level (CPL)	-0,716	0,013	0,512	51,21
	Vertical Horizontal Aspect Ratio (VHR)	0,668	0,025	0,446	44,59
	Low High Chroma ratio (LHCR)	-0,623	0,041	0,388	38,84
Masculine	Lines Curves Ratio (LCR)	0,907	0,000	0,822	82,24
Mature	Brilliance Dull Ratio (BDR)	-0,706	0,015	0,498	49,84
Static	-				
Artificial	Lines Curves Ratio (LCR)	0,846	0,001	0,716	71,60

From Multiple Regression Analysis (MRA), combinations of shape parameters that generated a perception were the outcome (see Table 8). More obtuse angles than acute angles, a low gravity point and a vertical and brilliant vase would be perceived as an elegant vase if all elements were present at the same time.

Table 8. Results from MRA on adjectives and aesthetic parameters (only those with $p < 0,05$ are shown, i.e. significant).

Elegant	b	t	p
Acute Obtuse Angle Ratio (AOR)	-0,743	-14,975	0,043

High Low Gravity Point Ratio (HLGPR)	-2,577	-14,585	0,044
Vertical Horizontal Aspect Ratio (VHR)	1,631	20,319	0,031
Brilliance Dull Ratio (BDR)	1,820	13,342	0,048

Line Curve Ratio (LCR), Complexity Level (CPL) and Vertical Horizontal Aspect Ratio (VHR) are parameters that affect the perception of many adjectives describing vases. It is therefore believed, that those three parameters are important to be kept in mind when designing vases.

4.4 Design rules

The results from the first and second phases were compared to identify which aesthetic parameters could be related to ownership through the adjectives. The outcomes of that comparison would be a second set of design rules that would target design to increase a desire to own. Some adjectives were already identified as being significantly related to ownership: beautiful, elegant, expensive and exciting. Looking at the aesthetic parameters of those adjectives, it was found that they share low complexity and high vertical horizontal aspect ratio (see Table 9).

Table 9. Comparison of aesthetic parameters and adjectives from CCA

Adjectives linked to ownership	Aesthetic parameter related to	Implication or reading
Beautiful	Low LCR, low CPL and high VHAR	More curves than lines, simple and vertical
Elegant	Low CPL, high VHAR and low LHCR	Simple, vertical and high chroma
Expensive	Low LCR, low CPL and high VHAR	More curves than lines, simple and vertical
Exciting	Low CPL and high VHAR	Simple and vertical

As a conclusion, vases that are simple and vertical have a higher likelihood of being bought (desire to own). Designing with those parameters in mind, the vases would be perceived as beautiful, elegant, expensive and exciting and would evoke ownership feelings on the consumer towards that vase.

5 CONCLUSIONS

Surveys were conducted with 71 participants to investigate the relationship between the desire to own a product and the perceptions evoked by the product. Previous studies have investigated the relations between shape parameters and perceptions and developed methods to successfully implement the discoveries into products with enhanced emotional appeal. This research built on those approaches to determine the relations for vases and went a step further with the identification of the perceptions evoked when people wanted to own a vase.

This paper has shown a process to extract relations between the appearance of the products and the perception induced by them; and has also identified the perceptions that are related to the desire to own a product. The results are based on the intention of participants to own a product which may differ from the actual purchase. However, the initial results have revealed, as expected, that the aesthetic parameters of a shape do affect the perception of the product. The design rules identified in this study offer guidelines for designers on what parameters are important in the design of vases and how they should be modified to achieve concrete perceptions that can lead to the stimulation of the wish to own the vase.

The main contributions of this study are twofold: first, a set of design guidelines relating product aesthetic parameters to perceptions; second, a set of guidelines targeting design for ownership. The results obtained in this study correspond to vases and although the design rules might not be directly transferable to other product categories, the method followed to obtain those design rules can be applied to obtain design guidelines for other product categories. It is acknowledged that relations between ownership and perceptions may be different for other products, i.e. beautiful for vases refers to curves, simple and vertical form, whereas beautiful for a car may be different, for example angular.

6 FURTHER WORK

Further work is planned to focus upon: validation, creation of an automatic tool and understanding the influence of culture. The design rules have been created based on a concrete set of vases and need to

be validated to verify the accuracy of their prediction on perceptions and ownership. If validated, it would be interesting to see how they could be generalized to explain other product categories.

The process used to evaluate the aesthetics of products is currently manual, meaning that the features of objects have to be counted individually for each vase by the researcher. The creation of an automatic tool to evaluate the parameters of objects, e.g. Achiche and Ahmed-Kristensen (2011), would really facilitate the process of assessing and interpreting aesthetics of newly generated designs even before releasing them to market.

Finally, a study to investigate the role of culture in influencing ownership and perceptions is considered. Colour has proven to share some common interpretations for people from different cultures and background, but also different interpretations. The influence of cultural aspects should be taken into consideration given that nowadays products are sold globally.

ACKNOWLEDGEMENTS

The authors acknowledge Stelton and the industrial designers for provision of the vase concepts, and thank the participants who kindly undertook the study.

The authors also thank Sofiane Achiche for involvement in the early phases of the survey design.

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