

CORRELATIONS BETWEEN SUCCESSFUL CONSUMER GOODS IN THE MARKET AND CREATIVITY IN FORM AND FUNCTION ATTRIBUTES

Sehn, Cristina Morandi; Bernardes, Mauricio Moreira e Silva; Jacques, Jocelise Jacques de
UFRGS - Federal University of Rio Grande do Sul, Brazil

Abstract

This article sought to correlate creativity in form and function attributes with successful products of consumer goods companies. For this purpose, it analyzed 20 products from a Brazilian company. The products were chosen at random from a list of products that were in the market between three to seven years. This period was reported by the company as indicative of market success for the products it develops. The measure of success was appointed directly by the marketing department of the study company. Then, a group of 15 judges evaluated creativity in form and function attributes through a Likert scale for the 20 selected products. The results obtained by means of data collection showed evidence of correlation between creativity and form and function attributes with earnings success.

Keywords: Attributes, Creativity, Evaluation, Market implications

Contact:

Prof. Dr.-Ing. Mauricio Moreira e Silva Bernardes
UFRGS - Federal University of Rio Grande do Sul
Department of Design and Graphics
Brazil
bernardes@ufrgs.br

Please cite this paper as:

Surnames, Initials: *Title of paper*. In: Proceedings of the 20th International Conference on Engineering Design (ICED15), Vol. nn: Title of Volume, Milan, Italy, 27.-30.07.2015

1 INTRODUCTION

A major contribution that an effective product and service development process can bring to a company is to increase market differentiation (Bessan and Ttidd, 2009). Differentiation takes place in various ways. One way is to conduct research studies that will explore the use of creativity in the design of products that stand out in a scenario where price is an important factor in purchasing decisions. Torrance (1970) defines creativity as a process whereby someone becomes aware of problems, deficiencies, or gaps in knowledge. This leads them to identify problems, find solutions, speculate or make assumptions, test and re-test these hypotheses, while possibly modifying them when reporting the results.

For Gardner (1988), creativity is a process whereby new ideas are created by one person or a small group of people, using specific skills within a given environment. However, there is no single, definitive concept of creativity but rather several definitions that involve different elements that are, in turn, made up of several attributes.

Researchers like Woodruff and Gardial (1996) define attributes as characteristics required for product description. There are several studies that have discussed the term. In general, they feature attribute ratings using exploratory factor analysis, which explains common variance between the variables (TSUPRYK 2007). Espartel (1999) conducted research in order to identify important attributes that motivate the purchase of products. A gap was noticed with respect to such attributes, creativity and success. For Czinkota, Kotabe and Mercer (1997), attributes represent physical characteristics motivating the purchase of a product while benefits are functions resulting from consumption.

The main objective of this research is to analyze the correlation between creativity in form and function attributes and the success of products developed by a consumer goods company. Specific objectives were to analyze ways of measuring creativity in products, study creativity attributes in products and adapt and apply a method for the analysis of the correlation between creativity in form and function attributes and the success of products in the market.

In the present research, it was assumed that creativity when designing solutions is expressed directly in the form and function attributes of a product. Thus, this study aims to fill knowledge gaps and relate creativity and success, and its results show evidence of correlation between these two variables.

2 CREATIVITY

Researchers like Amabile (1983; 1996), Csikszentmihalyi (1994, 1996), Sternberg and Lubart (1995) conducted studies on creativity in a social context considering it as a complex phenomenon where different components converge with each other. In their studies, there is research and debate on intrinsic and extrinsic motivational stimuli of the environments where people are present, as well as investigations of other components involved in the phenomenon of creativity (Hill and Amabile, 1993).

In the Componential Model of Creativity, Amabile (1997) defines creativity and the production of new, appropriate ideas in any area of human activity, ranging from science to business of everyday life. This model assumes that all human beings are capable of producing creative works in certain areas and that the social environment can sometimes influence the frequency of creative behavior.

Thus, it is understood that the design of creative products is possible by means of the interaction of multiple factors. Csikszentmihalyi (1994) points out that creativity is not an attribute of one single person, but of social systems that make judgments about individuals, emphasizing that objects and behaviors considered to be creative emerge from the social and cultural conditions in interaction with individuals' potential.

In the present study, creativity will be considered as quality of ideas and products validated by social judgment (Amabile, 1983, 1989, 1996).

3 MEASURING CREATIVITY

Studies on creativity measurement methods point to the work by Amabile (1982) as a source of reliable data. Prata (2007) presented an interview with Amabile defining consensual assessment as a creativity measurement process based on the assumption that people who are familiar with a job in a specific field know when something is creative. That is, based on their knowledge of and experience with activities and products in their own field, they know how to identify something new, something that works, which is useful (Prata, 2007).

Publications that referred to the consensual assessment technique include studies by Christiaans (1992), Christiaans and Venselaar (2005) and Pektas (2010). Interest in adopting the Christiaans method arises from applying the technique, whereby the author tests raters' expertise levels. For this purpose, the author recruited teachers and students with knowledge in design and students without experience in the field.

Christiaans (1992) showed, with the results of his studies, that creativity in product, illustrated by the data collected from raters, can be measured safely. Thus, different methods for measuring creativity were analyzed, and the method chosen was one that could reach the objectives defined in the present research. The selected method, adapted from Christiaans (1992), seeks to measure creativity in form and function attributes and correlate them with product success.

4 FORM AND FUNCTION ATTRIBUTES

Given the importance that form and function attributes play in product characterization, a review of the literature was made with references that allow the measurement of creativity through those elements. The list of attributes used in the present study is based on Veryzer's list of design properties (2000), as well as on quotes by Borja de Mozota (2011) and by Christiaans (1992).

The list of design properties, according to Veryzer (2000), is based on consumer experience and descriptions of project attributes grouped according to the operational, comprehensive, constructive and decision-making dimensions. Also according to Veryzer, such distinctions may be useful in clarifying different ways to address challenges posed by new products. The operative property of design was selected in order to search for attributes that could be incorporated into the function items. The selection criterion was ease of understanding. All function attributes were used except for proficiency and universality, whose definitions and applicability were doubtful and, thus, could compromise the results of this research.

Veryzer (2000) defines each attribute as follows: performance means the ability to perform a function or operation; usefulness serves a practical purpose, i.e., use. Innovation is meant as use of new or different ways of doing something; quality aims to meet or exceed expectations; durability is the ability to maintain design and integrity; compliance is the degree to which each operative characteristic of a project is consistent with established standards. Proficiency is the skill required for the product to be operated effectively; adequacy is the quality to serve the intended use; it includes the degree of compatibility. Universality is the ability to be used in full potential, and safety is designed to prevent accidents and promote proper handling.

This research was aimed at clarifying how the above-mentioned elements are characterized. These items can be described and related as follows: color, for Gage (1999), is one of the first elements used for perceiving space and setting rhythms; with this argument, he reveals the psychological function of color - which subsequently allows symbolic and functional value to be assigned to buildings and to space. Ornament, for Brandi (1956), refers to interior design; for Maguire and Simmons (2004), size is the actual greatness of things; scale, for Dondis (2000), is used to represent an actual proportionate measure. Proportion, for Santos (2011), is a part of the other in view of magnitude, quantity and grade. Materials, for Ashby and Johnson (2010), are the raw material for design; surface, for Manzini (1993), is the location of points where the material ends and the external environment begins; texture, for Munari (1973), is a granulation of surface. The concepts of attractiveness and interest were added to the list of function attributes, as an adaptation of the creativity measurement method used by Christiaans (1992). Thus, this is the list of attributes used in this research.

Among the reviewed criteria, the following attributes were selected for the application of the creativity measurement method: color, ornaments, size, scale, proportion, materials, surface, texture, performance, usefulness, innovation, quality, durability, compliance, adequacy, safety, attractiveness and interest.

5 SUCCESS AND FAILURE FACTORS IN PRODUCTS

According to Bessant and Tidd (2009, p. 179), there are numerous studies investigating the factors that affect the success of new products. Griffin and Page (1996) stated that the definition for this term depends on the objectives and strategies adopted by the company. Among the various measures used, Copper (1993), Griffin and Page (1993) cited the following: financial (if profits with a new product meet or exceed the goals and criteria of the company); consumer (the level of acceptance and

satisfaction of consumers can be indicative of product success), and product (product performance, speed for the product to reach the market, etc.).

As for the reasons for failure of products, Robertson (1971) mentioned: wrong choice of the launch occasion, insufficient marketing efforts, severe and unforeseen competition, and failure in distribution. Based on this statement, it should be noted that marketing has an effect on product success. Depending on how a product is launched, it may or may not be successful. According to Borja de Mozota (2011, p.109), marketing is the process of matching customer needs with goods and services that satisfy their desires.

Based on the success measures cited by Copper (1993) and Griffin and Page (1993), the sales and earnings parameters were then established as classification items for the success or failure of the products reviewed in the present study.

6 MATERIALS AND METHODS

For the development of this research, a Brazilian product-developing company was chosen for the sake of convenience and availability. The company provided a list of products that had been in the market for 3-7 years; 20 of them were randomly selected for the experiment. The selected product line is characterized by products targeted at the construction industry such as paint rollers and brushes, extension poles, sponges and spatulas. For this research, the participating company vetoed the inclusion of photos as well as the disclosure of the names of the products involved in the analysis. Sample size was chosen for convenience because time to conduct the research was short, and the assessment made for each product was complex.

The company completed a worksheet with information on the market success of the randomly selected products. The table was answered by marketing managers of the companies participating in the research, with the help of their assistants at the beginning of the experiment, at the time the products were selected. The variable "marketing performance" was also added to the questionnaire to clarify how it contributed to the success and failure of products. In this case, a score was assigned to marketing performance. Answers to all variables were given through a Likert scale (0-5).

To measure creativity in form and function attributes, the authors of the present study invited 5 math students, 5 design students and 5 teachers of design. This amount was due to limited resources and working time, although the experiment by Christiaans (1992) recommended 34 raters.

Rater selection was made by convenience and availability, and teachers and students from the same university as the authors of this article participated on a voluntary basis. In this method, some raters have no knowledge of products assessment, as is the case of Math students. The interest in adopting the Christiaans method arises from applying the technique, whereby the author tests the raters' expertise levels, which reflects consumers' judgment.

In the questionnaire designed for collecting data on creativity scores, the raters were asked to complete a chart composed of attributes divided into two groups referred to as form and function, with a total of 18 form and function attributes.

Each product was evaluated individually, considering the list of attributes based on Borja Mozota (2011), Veryzer (2000) and Christiaans (1992). Each rater filled in a chart about of form and function attributes. It contained fields for rater's name and product specification, a space for product image, the description of object to be assessed and the list of attributes. The judges rated the product for 18 form and function attributes.

Data collection was carried out on the premises of the School of Architecture, and Engineering of the University; each rater evaluated the products individually. The first step of the experiment consisted of an explanation of the research objectives and a presentation of the products and the charts to fill in the scores.

The evaluation of each product with all attributes took an average of 8 to 10 minutes to be completed. After the 20 products were evaluated by the 15 raters, each score was transferred to an Excel spreadsheet to be further analyzed in the software SPSS.

The following tests were used in the analyses: the Mann-Whitney test, Spearman's correlation coefficient, the Kolmogorov-Smirnov test and the t-test for independent samples. The results and final considerations for the application of the experiment followed the analysis and interpretation of data.

7 RESULTS AND DATA ANALYSIS

First, concepts were assigned to creativity in form and function attributes. Then, statistical analysis considered the average of the assessment of creativity by the 15 raters. Table 1 shows that, among the form attributes that were evaluated using the composite average, creativity in the attributes "size" and "scale" outperformed the other attributes, thus increasing the overall average.

As for function attributes, the products best evaluated by the raters, received a better average for creativity in "performance" and "usefulness." The items creativity in "ornaments" and "innovation" were highlighted in red because they received the lowest average when compared with other attributes.

Table 1. Means and standard deviations in the evaluation of relevance to creativity of form and function attributes.

Form Attributes	Average	Standard Deviation	Minimum	Median	Maximum
Color	6,36	,72	4,93	6,43	7,60
Trappings	4,78	,82	2,93	4,77	6,13
Size	6,97	,66	5,67	7,03	8,00
Scale	7,03	,71	5,53	7,10	8,13
Proportion	6,89	,79	5,13	7,00	8,00
Materials	6,77	,75	5,60	6,70	8,13
Surface	6,62	,73	5,27	6,73	7,80
Texture	6,55	,78	5,00	6,73	7,80

Function Attributes	Average	Standard Deviation	Minimum	Median	Maximum
Performance	7,21	,57	6,00	7,23	8,07
Utility	7,13	,43	6,33	7,10	7,80
Innovation	4,80	1,00	2,93	4,83	6,33
Quality	6,04	,92	3,93	6,33	7,33
Durability	5,87	1,01	3,60	5,97	7,53
Conformity	6,73	,87	5,00	6,73	8,40
Adequacy	6,66	,77	5,27	6,73	8,07
Security	6,87	,70	5,80	7,03	8,07
Attractiveness	5,64	1,04	3,47	5,47	7,40
Interest	5,57	,79	3,40	5,63	6,67

Other important data, generated in the implementation of the experiment, were the comparisons between the items earnings, sales and marketing performance, present in the questionnaire answered by the company (marketing managers with the help of their assistants). As can be seen in Table 2, the standard deviation level shows that the sample was properly selected, consisting of successful and unsuccessful products.

Table 2. Mean and standard deviations for earnings, sales and marketing.

Dependent Variables	Average	Standard Deviation	Minimum	Median	Maximum
Billing Success	2,70	1,17	1,00	2,50	5,00
Sales Success	2,70	1,17	1,00	2,50	5,00
Marketing Performance	3,10	1,12	1,00	3,00	5,00

When comparing the dependent variables, it was observed that marketing performance had the best results. For this situation, market response was lower. The U Mann-Whitney test was applied for finding a significant difference (comparison) ($p = 0.05$) between products that compete by differentiation and those whose focus is scale. Table 3 shows the data from the test.

Table 3. Comparison of product differentiation and scale.

Form Attributes	Competitive Strategy	Average	Standard Deviation	Minimum	Median	Maximum	p-value
Color	Differentiation	6,40	,75	4,93	6,53	7,53	0,702
	Scale	6,39	,72	5,40	6,30	7,60	
	Total	6,39	,72	4,93	6,43	7,60	
Trappings	Differentiation	5,03	,64	4,13	4,90	6,13	0,066
	Scale	4,21	,96	2,93	4,17	5,67	
	Total	4,78	,82	2,93	4,77	6,13	
Size	Differentiation	7,08	,72	5,67	7,13	8,00	0,171
	Scale	6,71	,48	6,00	6,97	7,07	
	Total	6,97	,66	5,67	7,03	8,00	
Scale	Differentiation	7,08	,78	5,53	7,10	8,13	0,645
	Scale	6,93	,55	6,13	7,10	7,47	
	Total	7,03	,71	5,53	7,10	8,00	
Proportion	Differentiation	6,96	,83	5,13	7,00	8,00	0,481
	Scale	6,73	,73	5,87	6,70	7,67	
	Total	6,89	,79	5,13	7,00	8,00	
Materials	Differentiation	6,80	,65	5,87	6,77	7,93	0,888
	Scale	6,71	1,00	5,60	6,43	8,13	
	Total	6,77	,75	5,60	6,70	8,13	
Surface	Differentiation	6,70	,72	5,27	6,77	7,80	0,507
	Scale	6,41	,79	5,67	6,17	7,53	
	Total	6,62	,73	5,27	6,73	7,80	
Texture	Differentiation	6,62	,76	5,27	6,77	7,80	0,533
	Scale	6,39	,88	5,00	6,43	7,60	
	Total	6,55	,78	5,00	6,73	7,80	

The p-value = 0.066 is close to 0.05 but it is not significant for the ornament attribute. However, because the value is near 0.05, there is evidence that products that compete by differentiation are more successful than those competing by scale. Thus, evidence also shows that creativity in ornaments had a greater impact on differentiation strategy than on scale. It should also be noted that, for raters, differentiation obtained a higher average compared with scale. This indicates that differentiation-oriented products performed better in creativity in form attributes. Table 4 shows the comparison between products that compete by differentiation and scale with respect to creativity in function attributes.

Table 4. Mean and standard deviations of creativity in function attributes.

Function Attributes	Competitive Strategy	Average	Standard Deviation	Minimum	Median	Maximum	p-value
Performance	Differentiation	7,28	,47	6,33	7,33	8,07	0,385
	Scale	7,06	,79	6,00	6,80	8,00	
	Total	7,21	,57	6,00	7,23	8,07	
Utility	Differentiation	7,14	,45	6,33	7,20	7,80	0,764
	Scale	7,09	,41	6,53	7,07	7,80	
	Total	7,13	,43	6,33	7,10	7,80	
Innovation	Differentiation	4,81	,96	2,93	4,83	6,33	0,856
	Scale	4,77	1,18	3,27	4,97	6,33	
	Total	4,80	1,00	2,93	4,83	6,33	
Quality	Differentiation	6,28	,63	5,20	6,47	7,20	0,147
	Scale	5,47	1,28	3,93	5,30	7,33	
	Total	6,04	,92	3,9	6,33	7,33	
Durability	Differentiation	6,28	,66	5,00	6,10	7,53	0,012*
	Scale	4,91	1,08	3,60	4,80	6,40	
	Total	5,87	1,01	3,60	5,97	7,53	
Conformity	Differentiation	6,94	,73	5,80	6,80	8,40	0,200
	Scale	6,24	1,06	5,00	6,17	7,80	
	Total	6,73	,87	5,00	6,73	8,40	
Adequacy	Differentiation	6,80	,66	5,93	6,87	8,07	0,184
	Scale	6,32	,94	5,27	6,30	7,87	
	Total	6,66	,77	5,27	6,73	8,07	
Security	Differentiation	6,90	,74	5,80	7,07	8,07	0,673
	Scale	6,79	,65	5,93	6,70	7,87	
	Total	6,87	,70	5,80	7,03	8,07	
Attractiveness	Differentiation	5,89	,85	4,07	5,90	7,40	0,105
	Scale	5,08	1,31	3,47	5,10	7,13	
	Total	5,64	1,04	3,47	5,47	7,40	
Interest	Differentiation	5,72	,53	4,87	5,67	6,67	0,231
	Scale	5,21	1,19	3,40	5,03	6,60	
	Total	5,57	,79	3,40	5,63	6,67	

Table 4 shows that, for creativity in function attributes, the differentiation strategy had a higher average when compared with scale. Creativity in the "durability" attribute was the only statistically significant ($p < 0.05$) item in products that compete for differentiation. Thus, there is evidence that

creativity in "durability" has a positive impact on the differentiation strategy. That is, in the evaluation of the raters, differentiation products have more creativity in the durability attribute when compared with other attributes.

Another important factor is the comparison of product success for earnings, sales and marketing with differentiation and scale. The test showed that for successful earnings and sales, differentiation achieved a higher average than scale, as shown in Table 5. Moreover, the influence of marketing was more significant in the differentiation strategy.

Table 5. Mean and standard deviations of success, sales and marketing.

Dependent Variables	Competitive Strategy	Average	Standard Deviation	Minimum	Median	Maximum	p-value
Billing Success	Differentiation	2,43	1,09	1,00	2,00	4,00	0,082
	Scale	3,33	1,11	2,00	3,50	5,00	
	Total	2,70	1,17	1,00	2,50	5,00	
Sales Success	Differentiation	2,43	1,09	1,00	2,00	4,00	0,082
	Scale	3,33	1,21	2,00	3,50	5,00	
	Total	2,70	1,17	1,00	2,50	5,00	
Marketing Performance	Differentiation	3,36	1,01	1,00	3,00	5,00	0,089
	Scale	2,50	1,22	2,00	2,00	4,00	
	Total	3,10	1,12	1,00	3,00	5,00	

For the context under analysis, it can be seen that products that compete for differentiation have a lower impact on earnings. On average, there is evidence that a difference exists between creativity in products that compete for differentiation or for scale (p-value around 0.05). The result shows that to achieve greater sales and earnings, a company needs to compete for scale. The latter strategy, in the study company, showed greater chance of success in terms of sales. Thus, it may be inferred that products that compete for scale have greater influence on the profitability of the study company. After performing the Mann-Whitney U test, Spearman's correlation coefficient test was used to check for a correlation between the scores for creativity in form and function attributes and marketing performance, sales and earnings. Table 6 shows this correlation.

Table 6. Correlation between creativity attributes and success factors.

Form Attributes	Correlation Coefficient	Billing Success	Sales Success	Marketing Performance
Color	Correlation Coefficient	,374	,374	,020
	Sig. (2-tailed)	,104	,104	,935
	N	20	20	20
Trappings	Correlation Coefficient	,198	,198	-,148
	Sig. (2-tailed)	,402	,402	,533
	N	20	20	20
Size	Correlation Coefficient	,040	,040	,339
	Sig. (2-tailed)	,866	,866	,144
	N	20	20	20
Scale	Correlation Coefficient	,214	,214	,209
	Sig. (2-tailed)	,366	,366	,376
	N	20	20	20
Proportion	Correlation Coefficient	,205	,205	,252
	Sig. (2-tailed)	,387	,387	,284
	N	20	20	20
Materials	Correlation Coefficient	,126	,126	,138
	Sig. (2-tailed)	,597	,597	,562
	N	20	20	20
Surface	Correlation Coefficient	,231	,231	,114
	Sig. (2-tailed)	,328	,328	,633
	N	20	20	20
Texture	Correlation Coefficient	,416	,416	,179
	Sig. (2-tailed)	,068	,068	,451
	N	20	20	20
Form	Correlation Coefficient	,245	,245	,216
	Sig. (2-tailed)	,297	,297	,360
	N	20	20	20

** The correlation is significant at 0.01 (2-tailed).
* The correlation is significant at 0.05 (2-tailed).

Table 6 shows Spearman's test for finding correlations between variables; however, as can be seen, there was no significance. Although all coefficients were positive, the correlation was inconclusive. For the experiment with products of the study company, it cannot be said whether or not creative products are also successful because the correlations are not significant. However, there is a statistically significant correlation between creativity in the attribute "texture" and success of earnings and sales. However, marketing performance did not seem to substantiate the answer to success. Spearman's correlation was also applied to function attributes, as shown in Table 7.

Table 7. Correlation between creativity in function attributes and earnings, sales and marketing.

Function Attributes	Correlation Coefficient	Billing Success	Sales Success	Marketing Performance
Performance	Correlation Coefficient	-,392	-,392	-,112
	Sig. (2-tailed)	,088	,088	,639
	N	20	20	20
Utility	Correlation Coefficient	-,250	-,250	,096
	Sig. (2-tailed)	,288	,288	,686
	N	20	20	20
Innovation	Correlation Coefficient	-,034	-,034	,111
	Sig. (2-tailed)	,887	,887	,642
	N	20	20	20
Quality	Correlation Coefficient	-,163	-,163	,048
	Sig. (2-tailed)	,493	,493	,841
	N	20	20	20
Durability	Correlation Coefficient	-,227	-,227	,062
	Sig. (2-tailed)	,335	,335	,794
	N	20	20	20
Conformity	Correlation Coefficient	-,313	-,313	-,104
	Sig. (2-tailed)	,179	,179	,662
	N	20	20	20
Adequacy	Correlation Coefficient	-,209	-,209	,052
	Sig. (2-tailed)	,376	,376	,827
	N	20	20	20
Security	Correlation Coefficient	,022	,022	,105
	Sig. (2-tailed)	,927	,927	,659
	N	20	20	20
Attractiveness	Correlation Coefficient	-,004	-,004	,053
	Sig. (2-tailed)	,987	,987	,826
	N	20	20	20
Interest	Correlation Coefficient	-,102	-,102	-,040
	Sig. (2-tailed)	,668	,668	,866
	N	20	20	20
Function	Correlation Coefficient	-,188	-,188	,012
	Sig. (2-tailed)	4,26	4,26	,961
	N	20	20	20

** The correlation is significant at 0.01 (2-tailed).
* The correlation is significant at 0.05 (2-tailed).

For function attributes, there is a statistically significant correlation between creativity in the attribute "performance" ($p = .088$) and earnings and sales success. However, no significance was observed for correlation between creativity and marketing performance.

With respect to the list of form and function attributes, the correlation between creativity values of those attributes was checked for a list of possible combinations, also using the Spearman's test. The objective was to find positive and statistically significant associations, as is the case of ornament and color ($R = 0.619$, $P = 0.004$). This analysis showed that the creativity of one single attribute was not responsible for the success of the company's products in the market, but rather the combination of them.

For example, creativity in the attribute "ornament" is correlated with creativity in the attributes "color" and "proportion". It is also correlated with creativity in the attributes "color", "size" and "scale". This means that, in general, if a rater assigned a good score to one attribute, the other attributes indicated in Figure, which are correlated to the former, also received a good score.

8 SUMMARY OF MAIN RESULTS AND CONCLUSIONS

For this purpose, the method used by Christiaans (1992) was adapted and applied. It consists of an evaluation committee with 15 raters. The experiment was developed in a Brazilian product-developing

company. First, creativity was identified in attributes whose average was better when compared with that of others. For creativity in form attributes, defined as color, ornaments, size, scale, proportion, materials, surface and texture, creativity in the attributes "size" and "scale" had the highest means, while for function attributes, defined as performance, usefulness, innovation, quality, durability, compliance, adequacy, safety, attractiveness and interest, the outstanding items were creativity in "performance" and "usefulness".

This means that creativity in these attributes had higher values than in the others. However, from the point of view of companies' representatives, it was found that despite the increased investment in marketing, there was no market return in the same proportion. Data analysis showed how creativity in attributes was evaluated when compared to competitive strategies for differentiation and scale. Such information can assist in the development of specific products for each type of strategy.

Products competing for differentiation stood out for creativity in the following attributes: ornaments and durability. This means that they performed better when compared with the others, and suggests that when developing specific products for this area, priority should be given to creativity in these attributes.

Positive correlations of creativity were found between texture and performance attributes and success, i.e., there are indications that they are directly related to the success of earnings and sales. As shown, creativity was composed of the average of all the form and function attributes. Although the results were not conclusive, that is, there were no statistically significant data, there is evidence that creativity is correlated with earnings success ($p < 0.05$) because p-value is 0.59. It should be noted that the survey sample does not represent the industry as a whole. It features the company involved in the research; therefore, it cannot be generalized.

As a result, the present study expected to contribute information by confirming the results, in order to motivate further research that can foster knowledge of creativity and product success.

REFERENCES

- Amabile, T. M. (1982) Social psychology of creativity: A consensual assessment technique. *Journal of personality and social psychology*, 43, 997-101.
- Amabile, T. M. (1983) *The social psychology of creativity*. New Jersey: Prentice-Hall.
- Amabile, T. (1989). *Growing up creative*. New York: Crown.
- Amabile, T. (1996) *Creativity in context*. Boulder, CO: Westview Press.
- Amabile, T. M. (1997) *Motivating Creativity in Organization: On doing what you love and loving what you do*. California Management Review. Berkeley California. Fall.
- Ashby, M. F.; Johnson, K. (2003) *Materials and design: the art and science of material selection in product design*. Amsterdam: Elsevier/Butterworth- Heinemann.
- Bessant, J.; Tidd, J. (2007) *Innovation and Entrepreneurship*. England: Wiley Editorial.
- Borja de Mozota, B. (2011) *Design Management: Using Design to Build Brand Value and Corporate Innovation*. New York: Allworth Press.
- Brandi, C. (1956) *Eliante o della architettura*. Turim: Einaudi. p. 156-163.
- Cooper, R. G. (1993) *Winning at New Product: Accelerating the process from Idea to Launch*. 2ed. EUA: Addison Wesley.
- Christiaans, H. H. C. M. (1992) *Creativity in design: The role of domain knowledge in designing*. Industrial Design Engineering: Lemma BV.
- Christiaans, H. & Venselaar, K. (2005) *Creativity in design engineering and the role of knowledge: Modelling the expert*. *International Journal of Technology and Design Education*, 15, 217-236.
- Csikszentmihalyi, M. (1994) *The Evolving Self: a psychology for the third millennium*. New York: HarperCollins Publishers.
- Csikszentmihalyi, M. (1996) *Creativity: flow and psychology of discovery and invention*. New York: HarperCollins.
- Czinkota, M. R.; Kotabe, M. & Mercer, D. (1997) *Marketing management: text and cases*. Cambridge: Blackwell Business.
- Dondis, D. A. (2000) *Sintaxe da linguagem visual*. São Paulo: Martins Fontes, p. 236.
- Espartel, L. B. (1999). *Atributos de Produto e Motivações de Compra no Mercado Jornalístico do Rio Grande do Sul*. Dissertação (Escola de Administração) Universidade Federal do Rio Grande do Sul, Porto Alegre.
- Gage, J. (1999). *Color and Meaning. Art, Science and Symbolism*. Berkeley: University of California Press.
- Gardner, H. (1988) *Creative Lives and Creative Works*. Cambridge, NY. University Press.

- Griffin, A.; Page, A. L. (1993) An Interim Report on Measuring Product Development Success and Failure. *Journal of Product Innovation Management*, 10: 91-308.
- Griffin, A.; Page, A. L. (1996) PMDA Success Measurement Project: Recommended Measures for Product Development Success and Failure. *Journal of Product Innovation Management*, 13: 478-496.
- Hill, K. Amabile, T. (1993) A Social Psychological Perspective on Creativity: Intrinsic Motivation and Creativity in the Classroom and Workplace. In: ISAKSEN, S.; MURDOCK, M.; FIRESTIEN, R.; TREFFINGER D. (Orgs.). *Understanding and recognizing creativity: the emerge of a discipline*. Norwood, New Jersey: Ablex Publishing.
- Maguire, D. E.; Simmons, C. H. (2004) *Desenho Técnico: problemas e soluções gerais de desenho*. São Paulo: Ed. Hemus.
- Manzini, E. (1993) *A matéria da invenção*. Lisboa: Centro Português de Design.
- Munari, B. (1973) *Diseño Y Comunicación Visual*. Barcelona: Gustavo Gilli.
- Pektas, S. T. (2010) Effects of cognitive styles on 2D drafting and design performance in digital media. *International Journal of Technology and Design Education*, 20, 63-76.
- Prata, P. (2007) Teresa Amabile: Um olhar microscópico sobre a criatividade. Disponível em: <http://pt.scribd.com/doc/495570/Teresa-Amabile-UM-OLHAR-MICROSCOPICO-SOBRE-A-CRIATIVIDADE>. Acesso em: 15/09/2014.
- Robertson, T. (1971) *Innovative behavior and communication*. New York: Holt, Rhinehart e Winston.
- Santos, J. R. (2011) *O conceito de proporção áurea e sua relação com a percepção da beleza em odontologia, a subjetividade do belo na arte, nas diversas ciências e sua aplicação odontológica*. Perse, 1º Edição.
- Sternberg, R. J. Lubart, T. I. (1995) *Defying the crowd. Cultivating Creativity in a Culture of Conformity*. New York: The Free Press.
- Torrance, E. P. (1970) *Encouraging creativity in the classroom: Issues and innovations in education*. Michigan: W.C Brown Co.
- Tsupryk, G. (2007) *Match Quality: Measurement and Applications*. The Graduate School. Stony Brook university.
- Veryzer, R. W. (2000) *Design and Consumer Reaserch*. *Design Management Journal*. Academic Review.
- Woodruff, R.; Gardial, S. (1996) *Know your customer: new approaches to understanding customer value and satisfaction*. Cambridge: BI