Automobile Design: Identification of effective visual elements of form

Mohsen Jaafarnia
Assistant Professor, School of Design, Hunan University, China
Ravi Mokashi Punekar
Professor, Department of Design, Indian Institute of Technology Guwahati, India

Abstract:
It is said that speech and visual communication are parallel and often interdependent means, by which human exchange of information takes place. Visual language communicates through visual elements. The elements of visual language include dot, line, plane etc. An image - for example a car - communicates an idea, helps people to visualize their thinking. The designer constructs visual units in the form of lines and transforms into meaningful shapes, structures or signs. Here, in this paper these considerations lead us to question, which element amongst the different visual elements existing on car design, can prove to be more vital or more effective in the communication of a car expression for the end user. How can these visual elements be identified? Further, are these visual parameters measurable?
The aim of this experiment is to seek possible explanation and identify the visual elements that is most suitable for transferring emotional value or establish emotional communication between the product and its user – in this case a car. It tries to highlight the visual elements that might be effective in car designing. The design of the experiment first involves generating a set of photographic images of car forms comprising the visual elements of car. Using this as the reference for enquiry, responses are sought from users regarding the visual form of the car. The researcher undertook a Sample Size of 65 subjects belonging to Iran, where 40 (61.5%) were men and 25 (38.5%) were women.
At the end the study, it has been examined from the deductions of the outcome of this experiment that the automobile form, comprising of all the visual elements and their attributes, form the most important parameter and the foundation for product communication.

1. Introduction
Speech as a means of communication cannot strictly be separated from human communicative activity, which also includes the visual language. The visual language is a system of communication comprising visual elements. The term 'language' in relation to vision is an extension of its use to describe the perception, comprehension and production of visible signs.

Designers use visual elements to create visual meaning. Whether geometric or organic, all forms are built on basic visual elements - dots, lines, surfaces, colour and texture volumes (Bowers, 1999). These visual elements come together in a holistic form formulating a relation together and it is not appropriate to claim which amongst them is more effective than the other. Uncovering and identifying certain aspects on visual design requires more understanding.

It is said that speech and visual communication are parallel and often interdependent means, by which humans exchange information. Visual language communicates through visual elements. The elements of visual language include line, shape, colour, form, motion, texture, pattern, direction, orientation, scale, angle, space and proportion. An image - for example a car face, a diagram, a map or a painting- communicating an idea, helps people to visualize their thinking. The designer constructs visual units in the form of lines and transforms them into meaningful shapes, structures or signs. In abstract art the qualities of line and shape, proportion and colour; convey direct meaning without the use of words or pictorial representation. Wassily Kandinsky (1947) in Point and Line to Plane showed the self

expressive quality of lines and marks. Referring to the dynamic nature of this exchange in art, Itten (1983) states that perception is a continuous judgment of scale and colour relationships and not just a passive recording of all that is in front of the eyes. Referring to visual perception, Arnheim (1970) suggests that perception involves the process of making categories of forms to classify images and shapes in the world. Cherry (1968) makes an important observation where she mentions that speech includes visuals and the term 'language' in relation to vision is an extension of its use to describe the perception, comprehension and production of visible signs.

Therefore the significance of 'perception' and 'Expression' leads us to ask these questions, which element amongst the different visual elements existing on car design, can prove to be more vital or more effective in the communication of a car expression for the end user. How can these visual elements be identified? Further, are these visual parameters measurable?

The aim of this study is to seek possible explanation and identify the visual elements that are most suitable for transferring emotional value or establish emotional communication between the product and its user in the case of car.

2. Design, Form and Sentiment

Designing is often a creative problem solving activity that considers the aesthetical aspects in addition to usefulness and tool making aspects (features). For instance, in the design and manufacture of a car, aesthetical features are as important a criterion as the productive and efficiency aspects of the product. If we assume that the most important contribution of the product designer is one of 'form giving' than it becomes significantly important that for an understanding of aesthetics or the science of perception in general and visual perception in particular, it would be necessary to engage in an understanding of:

a) Form Elements: Dot, Line, Plane, Volume, Texture, Pattern, Colour and a study of the interrelationships of these elements in form.

b) Form Attributes: Balance, Rhythm and Harmony etc.

These become the building block and the vocabulary that a designer utilizes in creating form and in communicating about its attributes. Does the common reference to 'Aesthetics' and 'Expression' so commonly used to describe the visual attributes of a car form mean the same? Herbert Read (1972) clarifies the difference in the terms 'Aesthetics' and 'Expression' in the context of plastic arts. Read suggests that any theory of art

begins with the supposition that man responds to '...the shape and surface and mass of things present to his senses, and that certain arrangements in the proportion of the shape and surface and mass of things result in a pleasurable sensation, while the lack of such arrangements leads to indifference or even to positive discomfort and revulsion.

....beauty is the unity of formal relations among our sense-perceptions' Herbert Read (1972).

Read states that in art, man's aesthetic sensibility is static. What is variable is the understanding which man builds up from the abstraction of his sensible impressions, his intellectual life. This, in his opinion, forms the variable element in art, that is to say, Expression. It may therefore be safe to assume that Expression denotes a more of direct emotional reaction and is intuitive.

If the role of the designer is one of creating 'product form', unlike the artist, his creation is functional and utilitarian in nature. Every end user who finally uses these products possesses artistic sensibilities which are shaped by a complex web of influencing factors as one responds to the 'visuals' in the product forms.

Read states that the response to the 'visual', may happen in three stages: first, at the mere perception of material qualities – colour, sound, gestures and many more complex and undefined physical reactions; second, at the arrangement of such perceptions into pleasing shapes and patterns. The aesthetic sense seems to end with these two processes. There may be, however, a third stage which comes when such an arrangement of perceptions is made to correspond with previously existing state of emotion or feeling. Then it is said that emotion or feeling has an 'Expression'.

The sense of Expression is therefore derived from the earlier two inherent processes of sensuous perception and formal (pleasurable) arrangement (of products / product systems).

There are other references to the aspect of aesthetics in philosophy and the plastic arts which suggests of being an engagement of a state of mind. Kant (1790) suggests that the aesthetic principle relies on emotion and not on senses. Sheppard (1996) in his book Aesthetics, introduction to the philosophy of art refers to Hume and Nietzsche who believe that 'Beauty is not the quality inside the material (thing) but in our mind and the emotion with which we look at those things'. Referring to the theory of imaginative expressionism Sheppard considers design as an attitude that reflects 'emotions along with internal tendencies and sentiments of the designer'. He states that in the final analysis, the

designer presents his internal passion and mental form and puts these feelings, expressions and internal passion into specific product designs that he displays in front of the public.

Tolstoy (1898), also an exponent of the Theory of Expressionism, suggests that all forms of art are a reflection and contagion of emotion in which the artist works and this plays the role of a medium that establishes communication between the artist and the addresser. Tolstoy separates art from intellectual action and perception. He considers art as the expression of emotions and sentiments.

From the above deliberations, one may summarize that if visual form of a product can contribute towards generating an aesthetic impression in the minds of the users more than the material itself, the sentiments, passion and internal enthusiasm of the designer will be the primary attributes reflected in the product so designed. According to this theory, a designer will have to model his design in such a way, so as to influence the emotions of the user in relation to their cultural background.

If in the ultimate analysis, the responsibility of the designer is one of 'form giving' (Bonsiepe 1989) and a goal oriented problem solving activity, then the professional designer plays a very significant role in bridging the demands of art on the one hand and technology on the other. This culminates into the marriage of the demands of these two streams.

The study and analysis of the 'aesthetic' elements in car form needs to be examined from the point of view of the designer who created the form and on the other by the manner in which the user responds to the 'visuals' of the car form.

With reference to the interaction between inanimate objects such as a car and the communication that takes place between the user and the product, it will be interesting to evaluate the role of human perception vis a vis the sense organs play. Also it will be interesting to determine if they can be studied and the influences of these expressions be measured.

3. Design and Emotions

Griffin (1999) suggests that products are indicators of meaning. The process of interpreting and decoding the unfamiliar products' meaning involves two different reactions. The first one is based on knowledge, and is dependent of communal and cultural surroundings and the second reaction is based on emotion. Meaning is then interpreted based on associations derived from previous experience.

'….. Furthermore, emotions are closely related to human psychology. If we were to look at a simple psychological definition of these factors that activate emotions, we would see that emotions are not triggered by situations or events, but by our thoughts, beliefs, values and attitudes about the situations or events. The emotional response is not an automatic response to an object, a thing, or a situation. It is an automatic response to the thoughts that we have associated with the situation or the object'.(Demirbilek et al. 2001).

Griffin (1999) further splits knowledge (thoughts, beliefs, values, moods and attitudes) and emotions into two different categories of reactions, which are closely related and are inseparable. Piaget (1990) states that people learn through their experiences and culture, which starts early in childhood, and is an ongoing process. Demirbilek et al. (2003) highlight how thoughts can be susceptible to change and the response or reaction to a meaning reflected by a product could vary depending on social class, educational level, religion, etc.

These developments highlight the importance of studying form and emotion and their contributions in a search for meaning in the generation of product form.

4. Designing for action and emotion

With reference to human emotions, Visser (2006) opines that emotions are conscious thoughts reflecting complex interaction of the mind and the body. Human behavior revolves around emotions and sometimes these emotions spring from reactions to different human actions.

However the responses of humans to man-made artifacts' such as a product can invite responses of various emotions including disappointment, attraction, shame, pride, disgust, contempt, admiration, satisfaction, fear, and anger amongst others. Prinz (2007) states that to declare an act as morally good is expressing strong emotions towards it. Similarly, products may also incite users' emotion in variations (Desmet et al. 2003). Desmet (2003) further states that people react differently to products; while some get inspired others get disappointed. Frijda (1986) on the other hand mentions that emotions become instrumental as they establish one's position in relation to ones immediate environment. Desmet (2002) uses this vision to draw up a broad model of 'product emotions' that sets forth three major parameters: (1) Appraisal, (2) Concern, and (3) Product. These three parameters, lead to whether a product can elicit any particular emotion. Wakefield and Baker (1998) points out that this is a primary reason for some products being chosen over others by users. Adding to this, Norman (1998) believes that pleasant looking things work better. Drawing from

these various literature sources, Forty (1995) summarizes that in the last fifty years the main function of design has been to make things beautiful.

The permanent element in making that corresponds to the element of form in art is man's aesthetic sensibility. Sensibility as such we may assume is static. What is variable is the interpretations, which man draws from the different forms of art, which are said to be 'expressive' when they correspond to his immediate feeling. For the same forms, man can have different expressive value, not only for different people, but also for diverse periods of civilization. … Form, though can be analyzed into intellectual terms like measure, balance, rhythm and harmony is really intuitive in origin (Read 1972).

In a good design, users derive expedient meaning from the product. This meaning can be an emotional expression that users sense. A study of the relation between visual elements and user's

feeling could help designers understand better what constitutes good Design.

These considerations lead one to the question as to, which amongst the different visual elements existing on car designs, prove important or more effective in the communication of the car expression to the end user. How can these visual elements be identified? Further, are these visual parameters measurable?

Lord Kelvine states:

"When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in number, your knowledge is of a meagre and unsatisfactory kind: it may be the beginning of knowledge but you have scarcely in your thoughts, advanced to the stage of science" (Sterling 2005)

It is only after clear understanding of concepts that one can have a measurable test about visual elements in car design.

Figure 1. Car samples

5. Experiment

The aim of this experiment is to seek possible explanation and identify the visual elements

(texture, colour, form etc.) most suitable for transferring emotional value or emotional communication from product to the user – in this

case a car. It highlights the visual elements that may be effective in car designing. The design of the experiment first involves generating a set of photographic images of car forms comprising the visual elements. Using this as the reference for enquiry, responses are sought from users to seek their response to the visual form of the car.

Therefore this paper sets out to examine the creative processes involved in the generation of visual forms that aims to express, communicate and invoke in the user a certain desired emotional response. It has traversed and covered ground through an experiment that examines what enriches the designers in understanding the meaning and communication of visual form in the context of automobile design. This paper has been based on qualitative techniques using an online survey.

The above considerations form the broad guidelines for formulating specific set of empirical experiments for this research which sets out to seek answers to the following research questions:

a) What factors are responsible for establishing the emotional relationship between a vehicle and its users?

b) Which one of the visual elements (texture, colour and form…) is the most suitable for transferring emotional value or emotional communication from product to user – given a vehicle like a car?

The experiment was planned in the following manner:

5.1. Selection of cars sample

Shown below are 21 views of car samples (19 cars) shortlisted and used in this preliminary test. The 21 views (of the 19 cars) samples were chosen by consensus and in discussions with three professional car designers.

Table 1: Identification of Car with associated expression

No	Car No.	Expressions
1	9L	Speedy
2	10L	Speedy
3	11R	Femininity
4	12L	Femininity
5	13L	Tenderness and softness
6	14L	Harshness and violence
7	15L	Harshness and violence
8	16R	Softness
9	13R	Novelty and freshness
10	18L	Speedy
11	19R	Seriousness

5.2. Planning Questionnaire

This preliminary experiment sets out to seek users' response to 'Expressive words' association vis a vis a set of car forms. The experiment sought to evaluate an overall understanding of users'

response to visual expression of the car form. In particular, questions were planned to gauge those visual elements (texture, colour and form…) that the user felt were the most suitable for transferring emotional value or emotional communication on the different profiles/views of the car. Sample Size: In this research, out of a total of 65 subjects belonging to Iran, 40 (61.5%) were men and 25 (38.5%) were women.

5.3. Structure of Questionnaire

The experimental set up and data collection methods were designed to be put on the Internet. The questionnaire was segmented into four steps.

Introduction: The questionnaire explained the purpose of data collection.

General information on profile of the user: The questionnaire had 8 questions pertaining to Age, Gender, Nationality, Education and Job etc.

Emotional categorizing: This part of the questionnaire was designed with 11 questions pertaining to emotional expression and corresponding categories of expression on the car form.

A set of 21 views of cars were shortlisted for this study viz. 9L (in two views), 9R (in two views), 10L, 10R, 11R, 12L, 12R, 13L, 13R, 14L, 14R, 15L, 15R, 16L, 16R, 18L, 18R, 19L and 19R) were presented in pairs. The respondents were asked to select the one that correspondents to the given expression.

The questions were posed as per the sequence below:

-Which car do you think conveys a sense of speed better than the other? (Q9, Q10 and Q18)

-Which car do you think communicates a sense of femininity? (Q11 and Q12)

-Which car do you think conveys a sense of tenderness and softness better than the other? (Q13)

-Which car do you think conveys a sense of harshness and violence better than the other? (Q14 and Q15)

-Which car do you think conveys more sense of softness? (Q16)

-Which car do you think conveys a sense of novelty and freshness better than the other? (Q17)

-Which car do you think conveys a sense of seriousness better than the other? (Q19)

Submission of responses: In this part of the questionnaire the respondents were required to press the submit button to send their data to database.

6. Data Analysis

Selected results for questions have been statistically compiled from the data collected and an analysis of the data was done by generating Pie

charts. Percentages emerged from each pair of car pictures per question.

In Question 9 "Which car do you think conveys a sense of speed better than the other?" 72.3 percent of subjects selected car 9L as a 'speedy' car. It implied that the graphical patterns (2-dimensional design) on sides of the 9L car conveyed the expression of speed for the subjects. Here both samples are of the same model belonging to the same company but differ in terms of the graphical design.
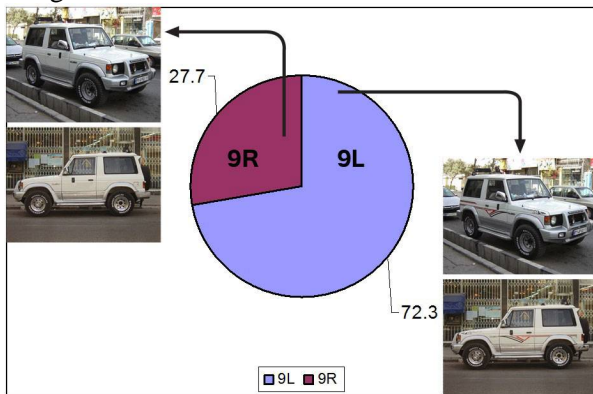

Figure 2: Question 9, Which car do you think conveys a sense of speed better than the other? (n=65)
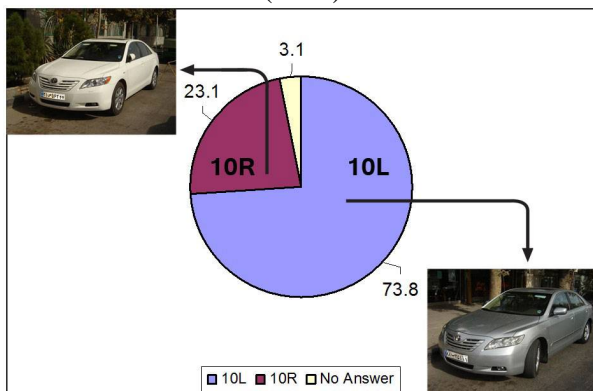
Figure 3: Question 10, Which car do you think conveys a sense of speed better than the other? (n=65)

In Question 10 "Which car do you think conveys a sense of speed better than the other?" 73.8 percent of subjects selected car 10L as a speedy car. It indicated that the reflection of the silver colour in car body conveyed the expression of speed for the subjects. Here both samples are of the same model belonging to the company but differ in terms of the colour.

In Question 11 "Which car do you think communicates a sense of femininity?" 72.3 percent of subjects selected car 11R as a feminine car. Here the light metallic blue colour in car body contained a feminine expression for the subjects. Here both samples are of the same model belonging to the company but differ in terms of the colour.
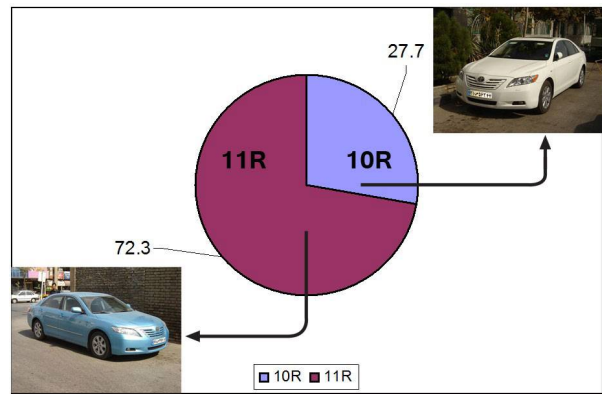

Figure 4: Question 11, Which car do you think communicates a sense of femininity? (n=65)
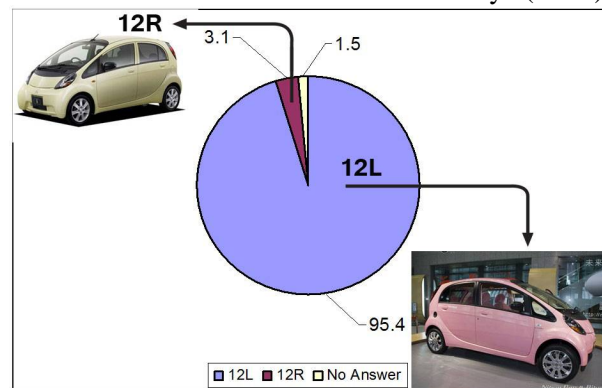

Figure 5: Question 12, Which car do you think communicates a sense of femininity? (n=65)

In Question 12 "Which car do you think communicates a sense of femininity?" 95.4 percent of subjects selected car 12L as a feminine car which means that the pink colour in car body held a feminine expression for the subject. Here also both the samples are of the same model belonging to the company but differ in terms of the colour.

In Question 13 "Which car do you think conveys a sense of tenderness and softness better than the other?" 98.5 percent of subjects selected car 13L. It means that the curvilinear angels and rounded arches in car body of 13L, indicated a sense of tender and soft expression for the respondents.
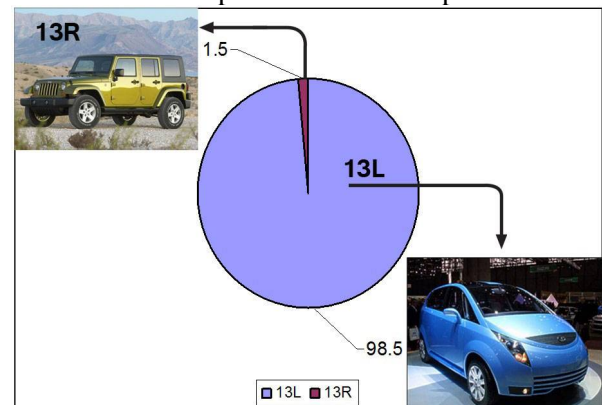

Figure 6: Question 13, Which car do you think conveys a sense of tenderness and softness better than the other? (n=65)
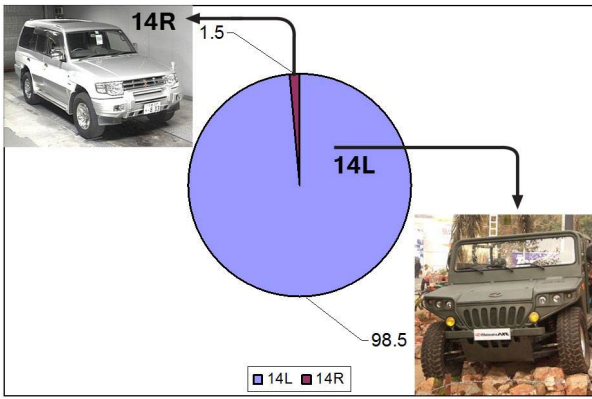
Figure 7: Question 14, Which car do you think conveys a sense of harshness and violence better than the other? (n=65)

In Question 14 "Which car do you think conveys a sense of harshness and violence better than the other?" 98.5 percent of subjects selected car 14L as one that indicates harshness and violence in cars.

In Question 15 "Which car do you think conveys a sense of harshness and violence more than the other?" 95.4 percent of subjects selected car 15L as a violent car, it means the vertical lines of the car generated an aggressive expression for the subjects. Here both samples are of the same model belonging to the same company but different in grill design.
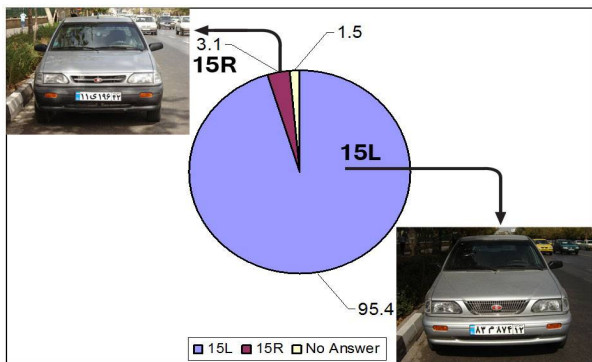

Figure 8: Question 15, Which car do you think conveys a sense of harshness and violence more than the other? (n=65)
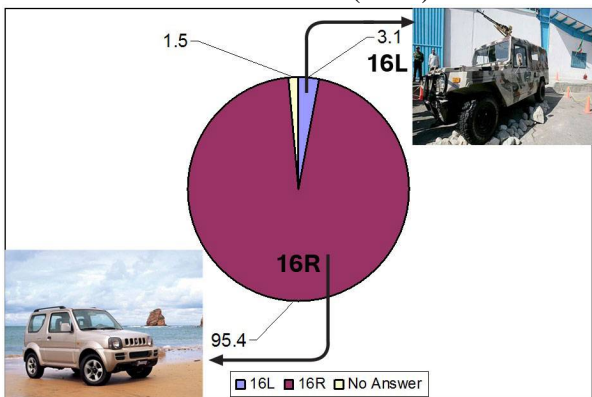

Figure 9: Question 16, which car do you think conveys a sense of softness? (n=65)

In Question 16 "which car do you think conveys a sense of softness?" 95.4 percent of subjects selected car 16R as a soft car which implied that the curvilinear angels and rounded arch in car body expressed softness.

In Question 17 "Which car do you think conveys a sense of novelty and freshness better than the other?" 92.3 percent of subjects selected car 13R as a novel and fresh car. It implied that the texture and reflection in car body incited fresh feelings amongst the respondents.
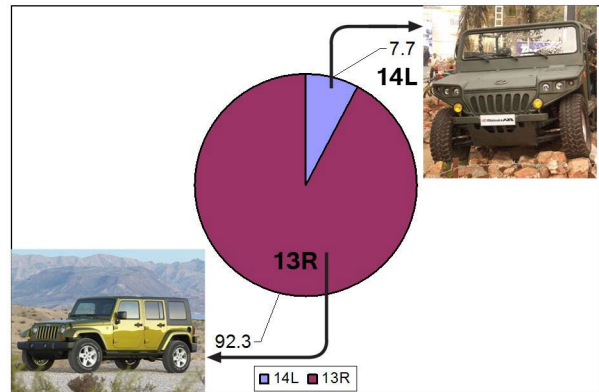

Figure 10: Question 17, Which car do you think conveys a sense of novelty and freshness better than the other? (n=65)
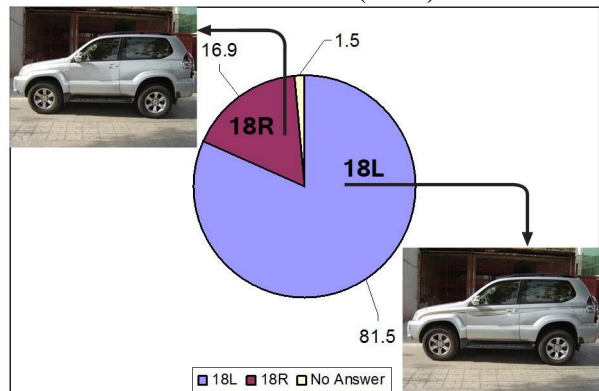

Figure 11: Question 18, Which car do you think conveys a sense of speed better than the other? (n=65)

In Question 18 "Which car do you think conveys a sense of speed better than the other?" 81.5 percent of subjects selected car 18L as a speedy car implying that the graphical pattern by the sides of car body expressed speed to the respondents. Here both samples are of the same model belonging to the same company but differ in terms of graphical patterns.

In Question 19 "Which car do you think conveys a sense of seriousness more than the other?" 87.7 percent of subjects selected car 19R as a serious car, which implied that the car face conveyed the expression of seriousness to the respondents. Here both the samples were of the same model but
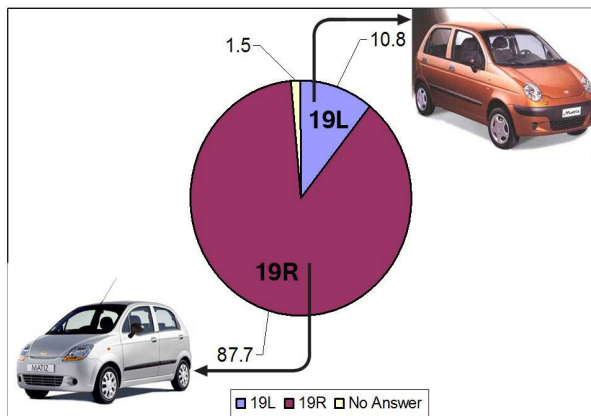
belonged to different companies.

Figure 12: Question 19, Which car do you think conveys a sense of seriousness more than the other? (n=65)

7. Discussions

From this study it is seen that users are very responsive and sensitive to the different expressive aspects of the visual elements of form, when we look at the answer of Question 9, 10 & 18 "Which car do you think conveys a sense of speed better than the other?" subjects select cars which have conveyed the expression of speed by using graphical lines, the reflection of the silver colour which the design could express speed to the respondents through the elements of line and colour.

In another case Question 11 &12 "Which car do you think communicates a sense of femininity?" subjects select feminine cars which have conveyed the expression of feminine by using the light metallic blue and pink colour in car body which the answer shows the significant role of colour element.

In Question 13 &16 "Which car do you think conveys a sense of tenderness and softness better than the other?" subjects select the curvilinear angels and rounded arches cars which implied the role of volume to express softness.

In Question 17 "Which car do you think conveys a sense of novelty and freshness better than the other?" subjects select a novel and fresh car with reflection which shows the importance of texture.

In Question 14, 15 &19 "Which car do you think conveys a sense of seriousness, harshness and violence better than the other?" subjects select aggressive and violent cars, based on the shape of lights and direction of lines in grill.

It is derived from the users' response that all visual elements points, lines, volumes, colour and texture contribute in a significant and holistic manner to the expressive quality of the car. Aesthetics occurs due to the presence of harmonious relationships between different elements of a composition and due to the quality of visual elements themselves (Federick, 2007).

8. Conclusion

Our study has been examined through an evaluative process involved in the study of automobile forms.

The constructivist approach looks at the visual elements in the automobile form in terms of their syntactic elements viz. lines, planes, volumes, colour and the inter-relationship between the play of these elements when they come together. Deductions from outcome of this experiment reinforces that the automobile form, comprising of all the visual elements and their attributes, form the most important parameter and the foundation for product communication.

It is also seen from the results of the experiment that respondents recognize form very well.

As is commonly accepted, this research reaffirms that 'holistic' form consideration in an automobile is important. Designers must look at the interrelationship between the various visual elements in a harmonious manner to achieve an aesthetic, pleasing and expressive form of the automobile.

References

1. Arnheim, R. (1970) *Visual Thinking*, London: Faber, ISBN: 0-571-09365-5.
2. Bonsiepe, G. (rpt. 1989) 'Semantic Analysis', in K. Trivedi (ed.) *Readings from Ulm: Selected Articles from the Journal of HfG, Ulm*, IDC, IIT Bombay.
3. Bowers, J. (1999) *Introduction to two-dimensional design: understanding form and function*, New York: John Wiley & Sons, ISBN: 0-471-29224-9
4. Cherry, C. (1968) *On Human Communication*. MIT.
5. Demirbilek, O. and Park, M. (2001) A survey of criteria for the assessment of good product design, *Proceedings of the Fourth European Academy of Design Conference,* Portugal: Aveiro, 370-377.
6. Demirbilek, O. and Sener, B. (2001) A Design Language for Products: designing for happiness, in M.G. Helander, H.M. Khalid and M.P. Tham (eds.) *Proceedings of the International Conference on Affective Human Factors Design*, London: ASEAN Academic Press, 19-24.
7. Demirbilek, O. and Sener, B. (2003) 'Product design, semantics and emotional response', Ergonomics, 46(13/14): 1346-1360
8. Desmet, P. (2003) *Designing Emotions*, ISBN: 90-9015877-4

9. Desmet, P.M.A. (2002) *Designing Emotions*, (Unpublished doctoral thesis) ISBN:90-9015877-4.

10. Desmet, P.M.A. (2003) Measuring emotion: development and application of an instrument to measure emotional responses to products, In M.A. Blythe, A.F. Monk, K. Overbeeke, and P.C. Wright (eds.) *Funology: From Usability to Enjoyment.*

11. Desmet, P.M.A., Hekkert, P. and Hillen, M.G. (2003) 'Values and emotions; an empirical investigation in the relationship between emotional responses to products and human values', *Proceedings of the fifth European Academy of Design Conference*, Barcelona, Spain.

12. Federick, M. (2007) *101 Things I learned in Architecture School*, Cambridge: MIT Press. ISBN: 978-0-262-06266-4

13. Forty, A. (1995) *Objects of desire: design and society since 1750*, London: Thames & Hudson, ISBN: 0-500-27412-6

14. Frijda, N.H. (1986) *The Emotions*, Cambridge: Cambridge University Press.

15. Griffin, S. (1999) *What Develops in Emotional Development?*, New York: Plenum Press.

16. Itten, J. (1983) *The Elements of Colour: A Treatise on the Colour System of Johannes Itten Based on his Book "The Art of Colour"*, in Ernst van Hagen (trans.) Wokingham: Van Nostrand Reinhold. ISBN: 0-471-28929-9

17. Kandinsky, W. (1947) *Point and Line to Plane: Contribution to the Analysis of the Pictorial Elements*, in Howard Dearstyne and Hilla Rebay (trans.) New York: Solomon R. Guggenheim Foundation.

18. Kant, I. (1790) *Critique of Aesthetic Judgment,* translated by James Creed Meredith. Adelaide: University of Adelaide, eBooks@Adelaide.

19. Norman, D. (1998) *The Design of Everyday Things,* London: The MIT Press. ISBN: 0-262-64037-6

20. Norman, D. A. (2004) *Emotional Design: Why We Love (or Hate) Everyday Things*, New York: Basic Books. ISBN:0-465-05135-9

21. Piaget, J. (1990) *The Child's Conception of the World,* New York: Littlefield Adams.

22. Prinz, J. (2007) 'Emotion and Aesthetic Value', Delivered at the Pacific APA, San Francisco. [online:] http://subcortex.com/EmotionAndAestheticValuePrinz.pdf [Accessed 29 August 2012]

23. Read, H. (1972) *The Meaning of Art*, London: Faber & Faber. ISBN: 0-571-09658-1

24. Sheppard , A. (1996) *Aesthetics, Introduction to the Philosophy of Art*, Ali Ramin (trans), Tehran: Nasher.

25. Sterling, B. (2005) *Shaping Things*, Cambridge: Mediawork. ISBN: 0-262-69326-7

26. Tolstoy, L. (1898) *What is Art ?*, in Saiid Varzandian (trans), Tehran: Chap.

27. Visser, W. (2006) *The Cognitive Artifacts of Designing*, Mahwah: Lawrence Erlbaum Associates. ISBN: 0-8058-5511-4

28. *Wakefield*, K.L. and Baker, J. (1998) 'Excitement at the Mall: Determinants and effects on shopping response', *Journal of Retailing* 74(4): 515–539