

TOWARDS A METHODOLOGY FOR INSPIRING AND EVALUATING AESTHETIC DESIGN SOLUTIONS

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ABSTRACT

In an attempt to aid undergraduate product designers in designing form, this paper proposes a method for inspiring aesthetic design solutions. The methodology comprises a system to research, analyse and synthesise images from a verbal semantic ideal. The undergraduate designers went forward to create a range of design solutions using the images as a catalyst for design activity. This paper reports on the investigation undertaken to date, providing discussion on the techniques used during the methodology. It details a case study whereby undergraduate product designers proposed stylistic design solutions for a mobile phone based on a verbal semantic ideal. This case study aimed to deter theft through the aesthetic impression and semantic messages as perceived by the third party. Observation showed that this methodology can offer a “quick start”, initial inspiration and means of evaluating design solutions in terms of their aesthetic impression.

Keywords: Aesthetic, design, verbal semantics, methodology

1 INTRODUCTION

It is a common perception that products have significance beyond their functionality. Consumers may refer to a semantic ideal when describing a product. The term semantic ideal is used to describe product stakeholders’ desires in terms of functional attributes, aesthetic impression and the emotional response engendered. That is to say, the semantic ideal is: what a consumer desires a product to ‘be’ or what a marketer or designer wants a consumer to perceive a product to be. For example a consumer may want a product to be secure, elegant and robust; this is the semantic ideal.

Successfully converting such ideals into visual solutions can provide products that match consumer desire. This paper works towards a methodology for inspiring and evaluating aesthetic design solutions in undergraduate product design work, through the exploitation of a verbal semantic ideal.

Semantic interpretation describes the way in which consumers perceive products through meaning [1]; what a product communicates about its functionality through its physical qualities. Semantic values are communicated through a product’s aesthetics; a product that ‘looks’ strong is perceived to ‘be’ strong. It is this aesthetic impression that critically determines the cognitive response of the consumer and the judgements they pass on the product. Creating positive aesthetic design solutions that meet the semantic ideal and communicate clearly to the consumer what a product offers over other products can provide the competitive commercial edge.

The authors noticed that product semantic expression and semantic interpretation were often underdeveloped skills in design undergraduates. However, the researchers recognised that senior industrial designers, and automotive designers in particular, often had an extensive visual vocabulary and the ability to discuss and generate appropriate form articulately. Previous research discussed the use of inspirational imagery by undergraduate designers. In particular the common lack of direct analysis of collected imagery. The methodology is an attempt to quickly move undergraduates towards the expert level in a shorter time than could be achieved through iterative cycles and experience alone. The following sections will take a look at past-related research, give a brief description of the methodology, the results and discussion will be made on reflection and future research.

1.1 Related research

Signs, symbols and representations are communicated through a product's external form [2]. Mono [3] applied a communication model to product design, mapping the psychological process from designer to consumer response. It suggests that the designer is the source of a message, be it semantic or symbolic and the designer can transmit this message through a product's aesthetic impression (shape, form, colour).

Giard [4] suggests that product's messages are perceived using a visual alphabet comprising lines colour, shape, form and texture, which in turn form signs and symbols [4]. The impact of a designer transmitting the wrong message or allowing room for misinterpretation can be devastating on the success of new product development. Other authors have addressed the evaluation of meaning carried by product signs and explore products as representations [5]. However this paper draws upon the relationship between visual product form and the designer's aesthetic intent. This research develops a methodology to aid novice designers ensure *more* 'right first time' aesthetic design solutions.

Theoretical frameworks have been proposed by other authors that aim to analyse and evaluate product form, thus to improve designers' understanding and communication of aesthetic intent. Warell [6] identified shortcomings in the subjective nature by which designers create and evaluate their ideas. The 'design syntactic' approach for analysis of visual product form supported the designer in assessing the content and structure of product form; it aided the evaluation of the visual effect perceived by the consumer. Breaking products down in four steps through visual scanning, element weighing, typicality and format assessment could also identify 'Visual commonality' within product ranges. Thus, allowing the designer to determine what contributes to a product's identity [7]. Dondis [8] proposed a bipolar system for studying product values. For example, analysing symmetry and asymmetry sequentially to provide to designer with a series of descriptive scales for product evaluation [8].

Reflecting on the work of Dondis [8], Chen and Owen [9] developed a 'style description framework' that presented designers with the ability to analyse existing styles and describe new styles. Comprising of 6 categories; form elements, joining relationships, detail treatments, materials, colour treatments and textures, the tool uses polar adjective scales to rank on a descriptive scale, the stylistic attributes.

Although past research has explored theory-based frameworks to aid objective assessment and evaluation of product form, the research has not been applied to a learning tool. This paper reports on the use of a new aesthetic evaluation and generation methodology in undergraduate design education. It poses the question, how can industrial design students, professionals and design academics be trained to align

aesthetic design solutions with a verbal semantic ideal? Can a methodology be developed to ensure the visual solutions match the semantic ideals and ensure a *more* ‘right first time’ design and development process.

2 METHODOLOGY

The methodology used a part of an evidence based research plan. It focuses on the extent to which a method can be developed to research, analyse and synthesise images from the original semantic ideal, better aiding novice designers in creating successful aesthetic design solutions. In this case four keywords represent the semantic ideal.

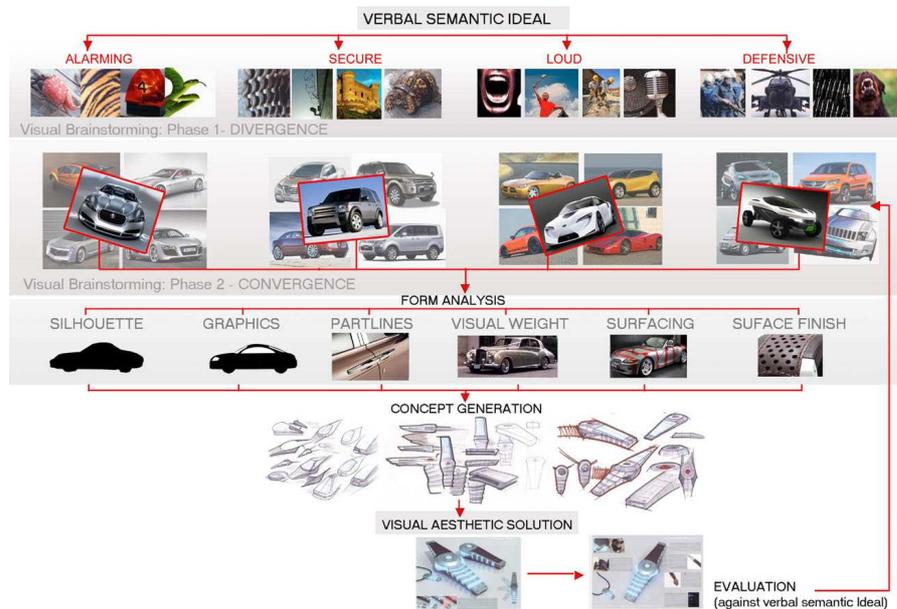


Figure 1 Diagram illustrating the methodology

2.1 Procedure

Undergraduate students undertaking the ‘styling and semantics’ module in the department of Design and Technology at Loughborough University, participated in a project applying departmental research from the ‘design against crime initiative’ (EPSRC funded). 72 students carried out the methodology in the process of designing a mobile phone to deter theft. The psychological background to crime prevention and the initial findings from this research were presented to the students. The design task involved investigating security strategies that, armoured, tethered, dispersed or disguised the phone. By identifying keywords appropriate to these deterrent methods, collecting images that conveyed these semantic qualities, students developed aesthetic solutions that embodied these qualities. Figure 1 illustrates the proposed structured procedure to research, analyse and synthesise various images deriving from the verbal semantic ideal.

2.1.1 Step 1: Verbal, semantic briefing

Students chose semantic ideals, expressed through 4 keywords, that they thought a mobile phone would meet to best deter theft of the device. They were then asked to explore the meaning of each chosen semantic.

2.1.2 Step 2: Image collection

The research participants were asked to use a visual brainstorming technique by collecting images to represent the appropriate keywords. This is the ‘divergent’ phase of the visual brainstorm (images are non-relative to the product being designed). It aims to expand the student’s scope for inspirational resource. The second stage of visual brainstorming is the ‘convergent’ phase. Undergraduate students were asked to collect 10 product images that they believed to be in-line with each verbal semantic ideal, e.g. 10 *secure*, 10 *strong* and 10 *intelligent* products. This encouraged students to build upon a visual library and identify products that correspond with the desired semantic ideal through their aesthetical form.

2.1.3 Step 3: Image ranking

Each series of 10 images from the convergence phase was then analysed and ranked by the undergraduates in order of suitability to the ideal, e.g. ten being the most and one being the least secure product. This pressed the young designers to identify and analyse what aesthetic qualities made the most ‘secure’ product look secure.

2.1.4 Step 4: Existing product analysis

Having built a large visual library of both convergent and divergent images, the students were asked to look collectively at the images and draw upon the most semantically appropriate to analyse and synthesise using 6 critiques (illustrated in figure 1) developed by the author.

- 1. Silhouettes:** Participants were asked to look at the exterior outline of different product forms. By identifying stance, proportion and direction they were able to convert complex silhouettes into their basic elevation views.
- 2. Graphics:** The term graphics was used in this instance to describe the interrelationship between the different materials that make up a product. The students explored how graphics can change the look of a product by breaking the surface area.
- 3. Part lines:** Similarly to graphics, part lines break the surface area down into sub-areas and can dramatically alter how the eye perceives a primitive shape. Often part lines differentiate between two part mouldings through materials or surface finish.
- 4. Visual weight:** Visual weight describes a product’s appearance in terms of how heavy or light a product is perceived to be. The semantic concept of weight is more commonly used to good effect by manufacturers of high cost goods.
- 5. Surfacing:** A products surface can be manipulated or ‘sculpted’ to change the appearance a product’s silhouette. Cars provide an excellent example of how semantic concepts can be communicated through surface sculpture and intersections.
- 6. Surface Finish:** Surface finish is a fundamental attribute to a products aesthetic value. For example, a more robust product might have a matt finish or a more dynamic grip detail. Identifying common surface finishes, textures and materials between different products enable the student to gauge what materials are apt to the semantic ideal.

2.1.5 Step 5: Concept generation

On the basis of the image analysis, the student designers went forward to generate a range of mobile phone concepts to meet the verbal semantic ideal and as a result deter theft.

3 RESULTS

The methodology requires the creation of two outcomes as a means of evaluating the aesthetic design solution against the original semantic ideal; a final visual presentation and a graphical summary of the collected imagery. The result enables an analysis of the work, building a convincing visual case against the aesthetic solutions proposed.

3.1 Design Case study 1

The 'Fortress' phone in figure 2 is inspired by: bank vaults, pad locks, tank tracks and armadillos, with simple machined surfacing and sharp intersections

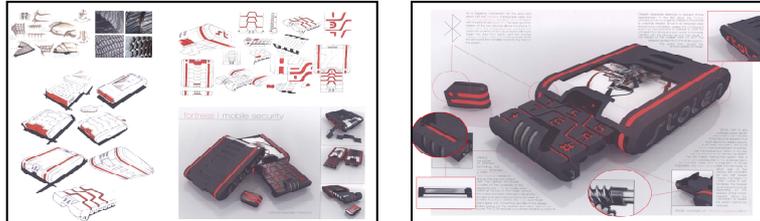


Figure 2 Mobile phone aesthetic design solution; verbal semantic ideal: armoured, intelligent, mechanised and avert

3.2 Design Case study 2

The phone in figure 3 conveys a strong snake like impression in silhouette, which projects a warning. The knife imagery, generated by the opening mechanism also conveys menace, and the surfacing is largely sharp and 'machined'.

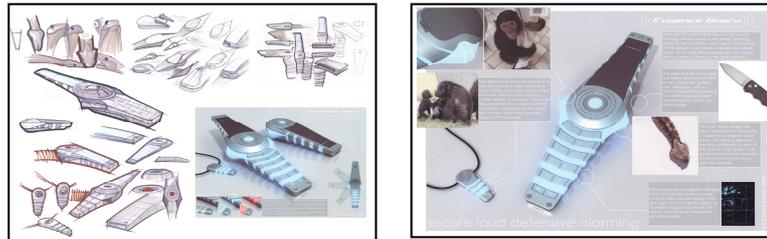


Figure 3 Mobile phone aesthetic design solution; verbal semantic ideal: secure, loud, defensive and alarming

4 DISCUSSION

Initial observations suggest that a methodology to aid designers in communicating a verbal semantic ideal could be developed. This aids communication, in that students can use the images to help articulate their thought processes and explain their intended direction before initial concepts evolve. The authors recognise that there are warnings against any rule bound description of what the activity of designing 'should' entail, as it only serves to inhibit the designer and the activity of designing. Inevitably, despite some initial resistance to the methodology it could be considered that *any* such method or means of working would be viewed as restrictive and met with the same response. Therefore, such a methodology would be more appropriately applied as a 'guideline' or 'framework' to assist design activity rather than a comprehensive description of what the activity of designing 'should' entail.

The method developed successfully encouraged pupils to research, analyse and synthesise images from the original semantic ideal. The method could be considered to

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have 'better' aided novice designers in creating successful aesthetic design solutions by providing them with a variety of individual techniques by which to better represent and evaluate the verbal semantic ideal. However, new spatial awareness improving drawing techniques had to be introduced to support the now more adventurous use of form. Students perceived a big improvement in the 'quality' of their work and were much more receptive to the methodology and further instruction. It is the author's belief that engagement in such a methodology enables pupils to expand their individual 'visual vocabularies'. By drawing on divergent and convergent influences it has made it much easier not just to discuss design solutions in terms of semantic values, but additionally better relate aesthetic values to a semantic ideal. It could be argued that as with all new teaching methods, the student recipients respond with demand characteristics. Whilst it is accepted that the sample size is limited and the results can not represent a response to the methodology for all undergraduate students, it does however provide an insight into how such a methodology can be used as a catalyst in the process of designing. To further evaluate such a methodology and its relevance to industrial practice, a larger sample within both an educational and industrial context would provide better discussion on its effectiveness as a methodology. Furthermore, the degree to which these aesthetic solutions convey their verbal semantic ideal and invoke the correct consumer response is the true test of such a methodology.

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