IDENTIFYING AESTHETICS IN DESIGN PRODUCTS – THE 3X3 MODEL

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ABSTRACT

This paper presents a model to survey and identify aesthetic parameters in design products. In an expanding field of abilities and knowledge of the design student, *aesthetics*, - being one of the fundamental, yet "soft" qualities, specific to design -, may have a hard time finding its space competing with more quantitatively oriented topics. When designers or design students work within a multidisciplinary setting, these "soft" qualities tend not to argue their case very strongly. The objective of this paper is, hence, to look at how to understand and apply a descriptive approach to aesthetics in learning environments and to use a model to present and discuss actual aesthetic content of existing products as well as initiate programming of the aesthetic content for new products.

Keywords: Form and aesthetics in collaborative design.

1   INTRODUCTION

By many design teachers and designers alike, aesthetics is considered hard to handle in teaching and practice and it is difficult to discuss or apply the phenomena systematically in design education. Researchers and philosophers have tried for centuries to describe aesthetics and within the last 30 years design thinkers have tried to set up frameworks that enable a structured understanding and discussion among product designers, researchers, design students etc. This has led to a variety of terms and categories that are partly overlapping, hence disturbing the general picture. In this paper, we therefore very briefly present a variety of these approaches and terms and set up a structure to map and discuss topics in relation to these theories either as a design teacher, as a student member of a design project group or as a practicing product designer.

Aesthetics is a basic element to consider when designing products, but aesthetic theory has it origin in philosophy, art and architecture. Vitruvius' classic triangular mapping of structure, function and form points out the role in architecture, while A.G.Baumgarten in the middle of the 18th century discusses the topic in his "Aesthetica" [1]with more focus on aesthetics in art, where the senses are seen as cognitive tools in their own right. In general, aesthetics is seen as a value-creating factor relating to a more or less defined set of rules, typically related to the visual appearance of an object. But recent design theory [2], [3] points out that product aesthetics should consider interaction with the user and the relation and references to other products, branding and societal values and conditions.

You could therefore ask to which extent and how aesthetics define value in product design and whether you can set up a framework that will make it possible to map aesthetic elements in existing products as well as function as a reference when discussing aesthetic intentions when developing new products.

2   AESTHETIC COMMUNICATION

2.1 Design as Aesthetic Communication

Design can be understood as communication [4] and therefore be analyzed using a conventional linguistic communication model. A designer's intention should be read and interpreted by the user more or less consciously, because the product should be seen as a messenger or a mediating subject although there is no direct feedback-loop from user to designer in most product design. But the designer tries to influence the user's interpretation of the object and the user tries to interpret the

intention of the designer. Part of communicating design is communicating aesthetic content and aesthetic experience.

The designer and the user must be aligned in the basic understanding of what the communication contains: The designer acts with an ideology/idea/intention to solve problems and give form via material or immaterial processes, as illustrated in Thomas Markussen's model (Figure 1) of Aesthetic Experience [5]:
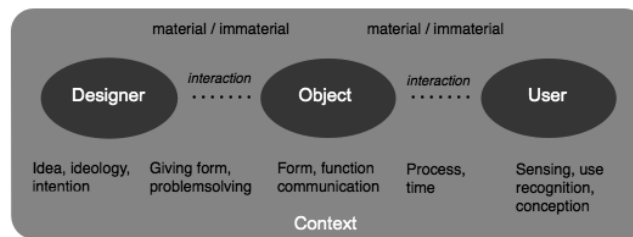

Figure 1. Elaborated model of Aesthetic Experience by Thomas Markussen [5]

An analysis of the aesthetic content can be articulated using a semiotic analysis of objects by Alvise Matozzi [6]. The model presents three different relations:

1. **Intra-objectual relations** deal with form, texture, harmony/disharmony, unity/diversity, object components;
2. **Inter-objectual relations** deal with to what extent it differs from similar/comparable product types;
3. **Inter-objective relations** describes the relation between designer, the designed and the user.

Matozzi stresses that an object is part of a network of relations and also a unity in itself.

2.2 Aesthetics and Usability

Aesthetics is not the main component in the usability-oriented design approach. But you can argue that it has an important catalytic effect in relation to usability as described by Donald Norman [2] and by Patrick Jordan [3], who are both seen as representatives of 'the emotional turn', which focuses on emotions in relation to functionality and use of products.

Donald Norman argues in "Emotional Design" [2] that emotional aspects of design is more important for the success of a product than the practical aspects. According to Norman, a person receives and handles information on three levels that affect the way we interpret design objects and aesthetics:

1. **Visceral** is the layer of immediate sensing, instinctive cognition. How does it look;
2. **Behavioural** is the layer that controls behaviour. How the thing is used, efficiency, usefulness and commodity;
3. **Reflective** is the layer that reflects and interprets. The meaning to each individual human like identification, memories, personal satisfaction; a holistic approach.

Norman argues that designing in an iterative process between the three layers might give a successful product, but possibly also a predictable and boring one.

Norman also points out that "…attractive things make people feel good, which in return make them think more creatively", thus giving the user more importance than he might even be aware of.

Patrick Jordan argues [3] that the "human factors" perspective is inadequate and he introduces the term "pleasure" to be able to work beyond the traditional parameters which deal with avoidance of physical and cognitive discomfort.

The term 'pleasure' covers a range of qualities such as enjoyment, happiness, well-being and the like and when the user's expectations are met, he will ask for more. This 'more' can be expressed in four dimensions of pleasure that are relevant when dealing with product aesthetics in a broader sense:

1. **Physio-pleasure** (body and senses: tactility, smell, sensuality and ability to cope with the physical task)
2. **Socio-pleasure** (relations – actual and abstract: to family and relations and more, but also abstract like relation to society, social groups, image and status)
3. **Psycho-pleasure** (emotions and thoughts, cognition and learning. Psycho-pleasure generated via interface etc.)
4. **Ideo-pleasure** (taste and value: taste as in what colour and music you like, and value as in moral conviction, believes, ethics. The person you want to be and be perceived as by others).

Operationally the four 'pleasures' can clarify a 'product benefit specification' that can lead to 'fitting-the-product-to the-person' – the main concept in Jordan's thinking.
The aesthetics is hence specifically relevant in physio-pleasures and ideo-pleasures.

3   STRUCTURE OF 3X3 THEMES OF AESTHETICS IN DESIGN

Structured in a diagram, you may find the presented approaches in Figure 2.
We have chosen these three *themes* (vertically in Figure 2): 1. Sensing and form, 2. Interaction and use, 3. Culture & Communication. And they are each identified in three *classifications* (horizontally in Figure 2): a. Focus, b. Object, c. Tool

3 APPROACHES TO AESTHETICS IN DESIGN	FOCUS	OBJECT	TOOL
SENSING AND FORM	**Genetics and senses** What is generated by senses and genetics. Experiencing physical comfort	**The Design Object** The physically experienced form, surface, colour, smell, sounds etc.	**Form Giving** The specific form that can be experienced directly. Form analytic skills and knowledge.
INTERACTION AND USE	**The User** The user and interaction as a focal point of the object	**The Interaction** The successful interaction, facilitated by the product aesthetics	**Testing** To ensure product validity, testing is done with models rather than build upon assumptions
CULTURE AND	**Designer, Design, User** The approach relates to these three on different levels	**Culture** The object possess an express cultural values to be interpreted and utilized in relation to the surrounding world	**Genetics and senses** What is generated by senses and genetics. Experiencing physical comfort

Figure 2. Structure of 3x3 themes of Aesthetics in Design, by Nanna Vestergaard [7]

In the next chapter the 3x3-model is described row by row and how they refer to the above mentioned design thinkers. In the coming chapter we briefly present how to use the 3x3 model when mapping a product.

3.1 Aesthetics in Design via Senses and Form

The first perspective in focus in the first category is aesthetics understood as a series of genetically determined conditions. Man is by nature pre-disposed to a particular sensory response to the environment. This is what Don Norman's *visceral design* refers to: as it is a biologically defined category where the sensory impressions and their interpretations are very basic. Such factors all relate to the surfaces of products. They are mostly independent of culture, and they can relate solely to the product but also to its dissemination through advertising etc.

Jordan's *physio-pleasure* would be the appropriate dimension to add here. It deals with the body and senses – what you can feel, smell, taste, hear and see. The focal point is that these senses must be activated to create an experience of comfort for the users when they are exposed to or interact with the product.

Here it is also relevant to refer to Alvise Matozzi's category *intra-objectual relations,* which describe the characteristics of the object itself such as shape, texture, harmony/disharmony, unity/difference in object components. All characteristics that can be understood as the form-related parts of an object as well as commonalities meaning repetitive elements of the object.

Key elements in this category of design aesthetics is direct sensing, genetically encoded preferences, elementary form analytical skills and knowledge and as a result: Knowing more about the impact of shapes and sensing on the recipient.

3.2 Aesthetics in Design Through Interaction and Use

When dealing with aesthetics in design through interaction and use, it is relevant to include Norman's *behavioural design* where the central concept is the use and functionality of the designed product. This requires the handling of four components: *function, comprehensibility, usability and physical sensation* as they provide the framework for the user's interaction with a given product.

Norman emphasizes that this is where you test your assumptions by using prototypes or mock-ups to evaluate functionality and use.

Jordan's *psycho-pleasure* might also be relevant to take into consideration at this point, as he focuses on how you experience what a product enables you to do: can you use a product to accomplish what you want without feeling insufficient? And does it help you to fulfil unpleasant tasks smarter and in a shorter time? Does the interaction with the product fully support the user's experience of his own abilities? Aesthetic effects such as colours can support this feeling, but the means must relate to the context.

Alvise Matozzi's *inter-objective relation* is relevant here as it relates to the object in use. This is where the basic meaning of the product is developed from the conditions defined in the object-internal relation which is an object's relation to similar objects.

A key concept here must be *ease of use* but with an aesthetic dimension. Aesthetics facilitates the user's ability to understand and use the product but it also facilitates the user's perception of own capacity and performance while using the product in a given context.

3.3 Design Aesthetics as Cultural Coding and Communication

Here Norman's *reflective design* relates to the message of a designed product or the use of this message. It relates to the product's importance to the user: How it affects the user's appearance, the image of the user or how you as a user communicate yourself with a product. Reflective design also includes the communication of the product itself – how it is marketed or branded and how it is perceived and evaluated as an item worth keeping or reacquiring.

This is where an overall assessment of the product takes place and this assessment is based on knowledge, cultural affinity and experience. This means that phenomena which can be seen as unaesthetic in the visceral layer can be perceived as aesthetic in the reflective layer, because the user has accumulated a cultural knowledge that enables him to assess the phenomenon as a carrier of aesthetics.

At this stage it is relevant to point to Jordan's concepts of *socio-pleasure* as well as *ideo-pleasure.* *Socio-pleasure* has to do with the things that connect us with each other, whether it is family connection or affiliation to groupings of other sorts. Social acceptance is a fundamental principle of human interaction and often refers to a community that can be decoded at an instance, for example by tattoos, clothing items and accessories supported by technology. From the car that enables us to meet or the web-access that facilitates certain forms of communication and represent endless possibilities concerning aesthetic content.

The *Ideo-pleasure* aspect is relevant to design aesthetics as a cultural coder and communicator as it mirrors our values and tastes or the tastes that we strive to possess. It can be understood as the picture we see of ourselves or the image others have of us – or the image we want them to have. Values reflect political, religious, moral or ethical issues and the tastes reflects the aesthetic preference. But not only taste can be expressed aesthetically; also the value-aspect can to a high extent be expressed as an object or communication.

If we turn to Matozzi, we can involve the *inter-objective relation,* which represents the field where objects get their fundamental meaning in the interaction with designer and user.

The key-topic here is self-perception and image based upon variable levels of reflection. Design objects are able to stage the user in a favourable or desirable setting. This staging can also support the experience of coherence with a community of like-minded in values or taste. Design can thus create communities and make them available.

3.4 Descriptive Use of the 3x3 Structure: Mapping a Product

We will now analyze the structure of a product, in this case the archetypical mass-produced monobloc plastic chair, which may generate more detailed aesthetic knowledge about the chair.

Figure 3. CUBA,white plastic chair, designer unknown, app. 1980, Jardin, Holland, price app. € 10

Senses and Form

Matozzi's intra-objectual relations deal with the form components (seat, back, legs etc) of the chair, which are many and complex, yet made in one continuous material of variable thickness with a shiny and smooth polypropylene surface. The transition from upper back to lower back is marked by drawing the material back and applying a rougher surface that continues to the seat, apart from seven rectangular shiny forms in the seat. The backrest is also divided into seven lamellas, tied together with a horizontal bar that is shaped like an arch, and which form armrests that with a 90° angle continues down into a leg that has an s-shaped section.

Interaction Adds Use

The chair seems to appear with a certain size of body because of its visual volume. But when sitting in it, you get a sensation of material fragility, because you can deform and destabilize the chair when twisting your body. At first the chair seems comfortable to sit in, but when touching the edges you sense rough remains from the moulding. The chair feels spacious and seems accommodating because of the embracing shape and a visual solidity, although not an actual one. It is a light chair, 2 kilograms, stackable, easy to clean, comfortable, cheap – these functional qualities that have made this chair extremely popular.

Culture and Communication

The popularity of the chair is a history of both success as well as an exposure of over consumption and a devaluation of objects/products. The popularity is due to a functionality linked with price; it often appears to be part of informal life, apart from conventions of formal life. Without pretences or ambitions, tolerated and not loved. In a sense a very democratic chair, but one without much status or recognition - on the contrary. The chair takes its form from French metal furniture as used in outdoor cafés, and has been produced by the company Tolix since the 1930'es. But due to the static and constructional qualities of the plastic material this chair holds another position and has become an object of every man in everyday life, widely accepted by people who would normally consider it too banal, cheap and therefore unaesthetic. It is also an object for people who hold a conscious and knowingly position, that deal with non-moral consumption and resistance to dilute the concept of quality. As it is a white, clean, smooth, comfortable object, you may perceive it as aesthetically attractive, but for the same reasons, you may also see it as unaesthetic, almost vulgar.

Put into the framework, this analysis of the monobloc chair may present itself like this:

3 APPROACHES TO AESTHETICS IN DESIGN	FOCUS	OBJECT	TOOL
SENSING AND FORM	**Genetics and senses** The common person, generate sense of welcoming, and comfort, of informality	**The Design Object** Mono material, variations in texture, white smooth, shiny, light in weight	**Form Giving** Coherent form, plasticity and fluid transitions, relate to like products, repetition of form
INTERACTION AND USE	**The User** Every man, informal use, informal object	**The Interaction** Material adequacy, embraced and secure experienc, ergonomic comfortability	**Testing** Full scale mock up, using comparable materials for physical testing
CULTURE AND COMMUNICATION	**Designer, Design, User** The ability to make the object "readable" by the user	**Culture** Create informal atmosphere, aiming at normality, middleclass values, plainness	**Genetics and senses** Regular brand position, no designer labeled, regular shops.

Figure 4. A Monobloc chair interpreted using the 3x3 aesthetic parameters, by the author

By making this analysis you may qualify aesthetic parameters; some may be known, some unknown, some may be much more detailed, some may lose their significance and some parts of the structure may not be filled out and some may overlap from one category to another as seen on the mapping of the Monobloc chair in fig.4. The model structures how to uncover the potential aesthetic content without claiming that it is complete. In education, this analysis should preferably be done in collaboration with other students/partners to survey and perhaps clarify the different perceptions of aesthetics.

3.5 Prescriptive Use of the 3x3 Model, Programming the Aesthetic Content for a Product

Obviously the model does not by itself determine specific detailed aesthetic decisions to be made in a design process, as such decisions will typically be based upon considerations that are defined by closer handling of form in process and context. We, therefore, mainly consider the model a tool for creating a common ground for aesthetic discussion and mapping of aesthetic approaches or phenomena regarding a specific product or a product proposal in a project group of practicing designers or design students. By merging the previously mentioned theoretical frameworks into the 3x3 model, we also want to implement a more contemporary view on design aesthetics that also involves product interaction aesthetics, communication and other aspects that reach beyond the classical limits of aesthetic analysis.

We have presented the model in an earlier version to groups of design students who then used it as a tool for discussing and mapping different objects and products. We found that the model actually opens up for new and more open way of discussing product aesthetics, but at the same time it opens up for a discussion on the interpretation of the *aesthetics* term itself. For instance, you can discuss whether using a well-functioning product interface has an aesthetic quality that is stronger than the visual appearance of the product per se. Or you can discuss to what extent the product is carrying other messages of aesthetic quality through its branding, context etc.

More examples of product mapping in the 3x3 matrix have been carried out [7], but we still have not tested the model as a prescriptive tool for setting up a design brief or as a dynamic tool in a specific design process. We imagine that the tool could serve as an ideation tool and a reference point in a design process by adding specific considerations or values in each of the 3x3 boxes or by using a 3x3 matrix for one product as a guideline for another product in the attempt to create proposals that carry the aesthetic dimensions of the reference product into new domains.

REFERENCES
[1]   Feagin, Susan L. and Maynard, Patrick, Aesthetics, 1997, (Oxford University Press, Oxford and New York)
[2]   Norman, Donald, Emotional Design, Why we hate (or love) everyday things, 2004, (Basic Books, New York)
[3]   Jordan, Patrick W, Designing Pleasurable Products, An introduction to new Human Factors, 2000 (Taylor Francis, London and New York)
[4]   Crilly, N., Good, D., Matravers, D. and Clarkson, P.J. 'Design as communication: exploring the validity and utility of relating intention to interpretation', 2008, *Design Studies, 29 (5),* 425-457
[5]   Markussen, Thomas, DSKD, 2008, lecture: Æstetisk Erfaring, presentation slides
[6]   Alvise Mattozzi, A Model for the Semiotic Analysis of Objects, 2009, *Design Semiotics in Use*, 1-27, (Helsinki University of Art and Design Press. Helsinki)
[7]   Vestergaard, Nanna, Aesthetic ID, Identification of Aesthetics in Design, 2009, Master Thesis, (DCDR, KADK, Copenhagen)