# Emotive Form Design

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## Abstract

Emotions are recognised as vital for human wellbeing and happiness, so are objects. However, studies on the practical use of emotions in product design remain limited. This academic project promoted the pedagogical encounter between emotions/dyads and the morphology/shape of products, based on the Plutchik's Emotion Wheel. The purpose is to improve and develop future designers' awareness of the emotive character of forms. In a visual thinking exercise, first-year students chose eight basic emotions to develop the forms of an 'emotional chair', drawing with pencil and paper to allow visual thinking and interpretation. The findings suggest that the Emotion Wheel is useful to reflect and manipulate forms to convey meaning, helping designers understand how to use emotive shapes for idea development and decision-making in the design process. This paper can contribute to teaching product design targeting emotional products, and offers guidance on how to evoke positive emotions through products.

Keywords: Product design, drawing, emotions, forms.

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## 1. Introduction

Objects have the power to give rise to emotions and have an effect on humans because cognition is inseparable from emotion. Emotions have the power to change the way we think. Emotions are time-tested solutions for adaptive problems and as such they play a key role in human reactions and understanding of new things (Norman, 2004). Emotions give meaning to things and make them important (Gross, 1999). As they trigger more positive emotions, attractive objects thus tend to become more successful.

On the other hand, images, their representation and visual thinking are fundamental for problem setting and benchmarking. The process of drawing allows contrasting the conceptual image and the perceptual image representation. It is therefore fundamental in the early stages of the design process. This exercise allowed the students from the drawing discipline in a product design course the opportunity to draw meaningful forms with a purpose to convey positive and negative emotions. Through the seen and the unseen forms, we can be able to broadly understand the meaning of the products. The exercise encouraged further research on form as an expressive vehicle of content and meaning, and addressed theoretical and practical concepts of project stages and hermeneutics, improving forms to improve products to improve people's wellbeing, happiness, and overall quality of life.

However, although there are many tools to produce design projects, such as CAD tools to develop 3D models, most of them address technical and functional aspects of objects. Despite all available tools to identify emotional responses to objects, their application still produces unclear information; and not helpful for designers to establish a clear product language according to their target audiences. The pedagogical project 'Emotional Chair' challenged and involved students, promoting a keener awareness on the need to produce products that are appealing to basic human emotions. Students were invited to draw the shape of a chair inspired on eight positive and negative human emotions based on Plutchik's Emotion Wheel. The exercise allowed understanding the relationships between emotions and shapes, exploring meanings and interpretations. Drawing was presented as indissoluble from design as instrument of freehand creativity and visual thinking. While sketching ideas, multiple interpretations were stimulated, as well as the creative production of different project solutions.

## 2. Emotions in Project Development

Damasio (2000) defines emotions as a complex set of chemical and neural responses organised to shape a pattern. They perform a regulatory role leading to beneficial situations for the organism, and their purpose is related to the maintenance of life in the organism. According to this author, emotions are biologically determined processes, depending on brain devices established innately, based on a long evolution timeline (Damasio, 2000). These devices are in a small group of brain regions and can be automatically enabled, with inter-individual variations and influenced by culture. The author distinguishes two groups of emotions: primary and secondary, and clarifies that the emotional system is directly related to behaviour and responses to given situations, as a physical reaction driving actions when facing certain stimulus (Damasio, 1996). Since we are born we produce emotional responses, and '(...) we're programmed to react with an emotion in a prearranged way when certain characteristics of the stimuli, in this world or in our bodies, are detected individually or as a set' (Damasio, 1996, p. 146). Emotion thus plays an early and fundamental role in human understanding and interaction with the world. Linked to cognition, emotions contribute to decision-making, and are essential in all human relationships (Damasio, 1996). The human emotional relationship with products has been the object of study in recent Design research, studying the adaptation of artificial environments to human emotional needs. Designers are thus increasingly required to understand emotions in order to achieve better design goals. These goals refer to users' emotional satisfaction, positive emotional responses and increasing the emotional effect of the product, thus fostering

positive purchase decisions and consumer loyalty. These goals can be achieved by lessening the negative emotional impact of the product experience, and following up on the relationship with the product after purchase. This allows understanding the emotional attachment to products and the positive, renewable and consistent interaction with products. One example of this is IKEA programme of customer experienced product quality, also derived from consistently positive emotional experience. Emotion has had a special place in design since the experience of a pleasant image sensation reflects in the creative potential, resilience and ability to solve technical problems, reflecting for instance in the design for Google workplace, identified as workplace culture of creativity. Ultimately, attractive products work best. The more attractive they are, the more positive emotions they will trigger, thus contributing to better human performances and wellbeing.

### 2.1. Emotional design

The role of emotion in design has been active for longer than recognised, rather being emphasises logical reasoning or product engineering attributes. However, design consistently and implicitly considered emotions, since 'Design, at its most basic level is about rendering more desirable objects' (Greenhalg, 1993, p. 105). Today, in a consumerist and hedonistic society, intangible emotions make their way through, with the explicit introduction of the field of emotion in design. Rational factors may determine practical function, performance, usability, price, among other aspects, whereas emotional factors are responsible for decisions, aesthetics and the symbolic functions of objects. Symbolic functions are evidenced by appearance, shape, colour, texture and also by meanings conveyed, that is, what the object represents to the individual. According to Baxter (1998), an attractive product is one that attracts attention and becomes desirable because it is visually pleasing, stirring the desire to acquire it. However, even if the product is not purchased, it may be enjoyed and appreciated with pleasure, as is the case of interactive displays or, more generally, visual communication products. For Jordan (1997), the development of a project must be user-centred, concerning usability and the aspects that allow pleasurable products and consistently positive emotional experiences.

Emotional design concerns the design of products that combine function and aesthetics in order to produce objects that trigger a set of emotions in consumer, improving their decision-making and problem solving processes (Norman, 2004). Emotions are a factor common to humans and animals; however, human emotions have a distinct character insofar as these are linked to actions, judgments and values intrinsic to human life. The impact of emotions depends directly on the senses involved in those emotions. Feelings allow emotions to affect the mind, and without emotions we wouldn't be able to take pleasure out of life and enjoy the surrounding world. Emotional design considers three brain levels involving different stimuli. The visceral level relates to objects' appearance; the behavioural level relates to objects' use, and finally the reflective level relates to objects' meaning (Norman, 2004), as shown in Table 1.

**Table 1. Three levels of design**

| Visceral | Behavioural | Reflexive |
|---|---|---|
| Concerns the product characteristics that stimulate the senses. Concerns the initial impact of the products. | Concerns aspects related to product use and experience. Comprises four components: function, responsiveness, usability and physical features such as texture, weight and surface. | Concerns product meanings, or their use. Addresses the long-term relationships, culture, satisfaction in ownership, display or use and the identity of the person regarding the product. |

### *2.2. The shape of emotions*

Shapes are built of dots, lines, planes, surfaces and volumes. They are made richer through texture, colour and materials. The combination of these morphological elements creates a project. In the same format, all these elements contribute to the perception of meaning. A three-dimensional shape consists of many two-dimensional shapes. These shapes are revealed as a volumetric form, rotated to create the total visual appearance of a project, keeping shape as the main identifying factor (Wong & Wucius, 1977). Taking advantage from our intuitive perception, visualisation of forms and their use, design products may be built to communicate meanings (Gorno & Colombo, 2011). Also in capturing the emotionality of some information or experience, and transform that emotionality into sensory physics into attributes such as form, so that our expectations of the products are extended to functionality' (Crilly et al., 2004).

Shape is one of the main contributions to what a product can convey. Based on the contextual associations related to the function of a product, the influences of form and aesthetic characteristics are what we first perceive. The visual form: it plays a key role in physical interactions between users and objects. We have an unconscious understanding of the meaning of the different physical objects through our interaction with them, whether through their cultural symbolism, our experiences or our intuitive reactions to them (Krippendorff & Butter, 1984). In this sense, objects can express this meaning through their physical personifications of their functional conceptions that 'friendly' indicates how to use them, their colour and materials that express the aesthetic qualities of culture and its forms that convey a combination of logic and expressive meaning (Blijlevens, Creusen & Schoormans, 2009). The forms of objects convey emotional perceptions, both in nature and in man-made objects. Although in general the products may have symbolic meaning that we recognise through their general structure aspects, the details of form can extend those underlying meanings to convey a more individual character (Luecking, 2002).

Nonetheless, our perception of objects is shaped by our previous experience, intuition and extrinsic reactions. Artists and designers are sensitive to these aspects of perception and use them to evoke the meaning of their creations (Csikszentmihalyi & Halton, 1981). Product semantics is the study of the symbolic qualities of the forms created by man and the meaning can be transmitted through the respective qualities. These qualities can be of any representation that is perceptible to the human being interacting with the object (Gregory, 1966). When combined, they seduce our senses, cognition and emotions. According to Van Breemen, the main means of communication is the object. But colour, texture, material, and other visual properties also play an important role. In fact, all of these properties of the object imprint and exert emotion (Van Bremen, Knoop, Horvath, Vergeest & Pham, 1998). Designing objects thus serves more than a utilitarian function; things express a certain character. This feature was present in creative arts for millennia, at least since the rupestrian paintings.

### 3. Pedagogical case: Emotional chair

Drawing building images constitutes a basic tool to develop design. Disegno is a synonym to drawing in the Latin etymology of the word and is the Italian word for both drawing and design. In the Product Design course, the Discipline of Drawing has a particular curricular significance. It is considered as a design thinking instrument. It graphically mediates visual thinking, enabling critical reflections during and for the creative process, simultaneously constituting input and output. Used as a non-verbal language, metaphorically understanding language as the translation of ideas, drawing is a tool to think and device to display thoughts and recall imagery, often found embodied in images through graphic elements prior to rationalisation or compliance with project templates or rules.

### 3.1. Plutchik's emotion wheel

The American psychologist Robert Plutchik developed an evolutionary theory of emotions. He proposed that both animals and humans have evolved their emotions to adapt to the environment. Plutchik's (1991) theory is based on the notion that emotions are 'biologically primitive', emotions we feel based on our subconscious instincts such as reproduction, protection, possession of repulsion, etc. Our perception of the character of an object is also often based on an instinctive, subconscious feeling, which Desmet describes as a 'change in the nucleus affect' (Desmet & Hekkert, 2007). According to Plutchik's theory, emotions are combined to form different levels of dyads, in a structural model to mix different emotions in different proportions, producing the emotions we experience in life, in a process similar to colours making. These blends of primary emotions are called dyads, and joy + anticipation = optimism, as shown in Figure 1.
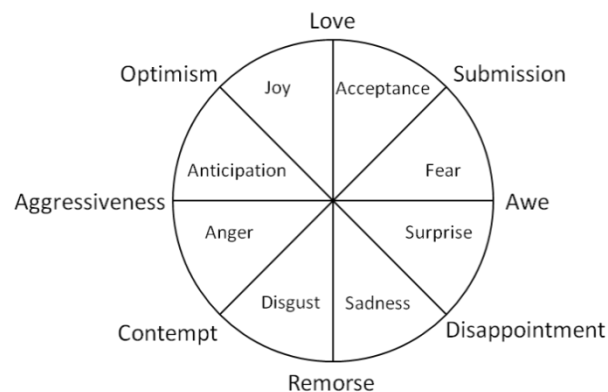


**Figure 1. Plutchik's emotion wheel showing primary emotions (inside the circle) and dyads (edge of circle)**

To explain this in a graphic way, he divided emotions in eight basic or primary categories, with clear specific functions for survival: fear, surprise, sadness, disgust, anger, hope, joy and acceptance. All other emotions are combinations of these primary emotions, expanding the range of experiences. The eight dyads used for the emotional chair were optimism, love, submission, awe, disappointment, remorse, contempt, and aggressiveness. Several emotions include facial expression analysis, neurological reactions and psychological instincts (Ortony & Turner, 1990). However, this categorical model of emotions defines a discrete set of primary emotions as essential to obtain all other emotions, which was why we chose Plutchik's (1991) theory of primary emotions: acceptance (or confidence), joy, surprise, anger, fear, sadness and anticipation.

### 4. Connecting Shapes and Emotion

The first impression is key for the purchase decision. It is often decisive for buying a product or not. In fact, '(…) design thinking goes far beyond technique and technology. Products don't speak. However, they are means of communication, media for visual language, for impressions, and emotions, which will in turn affect potential buyers, positively or negatively. We live surrounded by objects designed to please' (Curralo & Soares, 2015, p. 711). This project allowed young product design students, in the discipline of drawing to draw, interpret and communicate emotions through forms, in this case the forms of a chair designed to convey emotions. The act of drawing for design thinking was presented as a tool and a methodology for product design. It allowed brainstorming and the opportunity to formulate, interpret and translate features with the ability to produce an emotional response from viewers.

Drawing is considered a reliable and useful project investment to enhance our knowledge about our emotive perception of shapes. To explore the unconscious understanding of the meaning of different

physical objects requires extensive interaction with them. This early part of the design process, where a designer thinks and identifies the sort of forms will best convey the intended meaning, must be consciously understood. This language that allows inscribing meaning without words into objects, through their physical geometries, requires thorough manipulation of forms and hermeneutic interpretation, translating onto shape the understood meaning of the word for a given emotion. Another objective was to raise awareness between positive and negative emotions. Objects appeal to our subjective emotional side, such as recalling a given moment in time. Ultimately, objects are meaningful because of emotions (Gross, 1999). The exercise was intended to provide important insights for improving product design and emotional design strategies as well as for the communication of the relationship between the user and the product. Yet, it adds depth to the understanding of the nature and quality of shape morphology. The main objectives of the exercise included the importance of the emotional system, developing the own traits of expression and visual communication with a more conscious access to emotions, and learning to explore new working methodologies associated with drawing as a form of representation, acquiring a taste for experimentation, new challenges and new ideas.

By drawing, we enunciate our desires and objectives, according to a perspective that may be chosen or discovered, guiding a realistic direction of greater likelihood, by quickly sketching multiple hypotheses in search for a better solution. This allows awarding graphical equivalence to different emotional states. When we draw we 'instinctively' express emotions. Some sketches will be validated and adopted to generate new ideas, while others will be discarded or modified and combined. Drawing this emotional chair allowed junior design students to acquire the concept of emotional design and the will to communicate through medium other than words, so that in a near future they will be competent to develop products with a pleasant emotional and aesthetical appearance.

### 4.1. Methodology

Exploring emotional shapes through drawing, this project involved first year students of Drawing I, including 42 students (22 women + 20 men), aged from 18 to 20. All students were asked to represent two-dimensionally one 'Emotional Chair', representing one of the eight emotions, randomly chosen by the teacher. Through main notions and basic techniques of drawing, to develop and perfect a personal style, resorting to the use and mastery of various expressive materials. The briefing of the exercise consisted of drawing the shape of a chair in order to convey or express one of the eight positive and negative human dyads based on Plutchik's Emotion Wheel. Besides graphite pencil, students could alternatively use markers, ballpoint pen, or china ink. In 15 minutes, they would have to represent their own 'emotive chair'. At this stage, physical features such as ergonomics or materials were not important. The purpose was merely to develop the morphological design of a chair. Students were asked to concentrate on the shapes of the chair, after listening to a small text on emotions. They were expected to apply the acquired knowledge in the most favourable possible way, exercising their minds for future experiences, and also to manipulate and speculate on shape and emotion, deciding by themselves on a final drawing, and afterwards describing verbally to the group their creative process and conscious decisions.

This practical and theoretical pedagogical experience is based on freehand informal representation of emotion. Junior design students in the drawing class were invited to think of an emotion and how to represent it through the shape of a chair. The exercise was not intended for quantitative evaluation. The translation of the idea into the object, or from meaning to shape is often considered an intangible process because it only exists inside the designer's head. However, 'only the products that appear in material form come into the eyes of the man on the street' (Gregory, 1966, p. 3).

## 5. Results and Discussion

The results of this exercise are very varied, consisting of a wide range of representative forms of chairs, as shown in Figure 2. Each chair representation indicates the word for the emotion that shaped the forms of those emotional chairs, based on Plutchik's emotion wheel. Some drawings are characterised by symbolically representing a mix of emotions. In general, positive forms are represented by soft and organic curves, as patent in the 'Optimism Chair'. Negative emotions were represented by small and medium-sized heavy forms and angular curves of thin proportions, such as for the 'Aggressiveness Chair' and 'Awe Chair'. It is also interesting to note that some students resorted to visual meanings to represent the emotional chair, using a previously accepted code of shape meaning, such as smileys, emoticons or emojis. This is the case of the 'Awe Chair', in Figure 2, where the students drew a shark or the Disappointment chair that the back is represented by a tearful eye and their tears flow through the chair. The imagery context framed in this exercise, allows us the access to design a variety of images.

(a)

(b)

(c)

(d)

(e)

(f)

(g)                    (h)
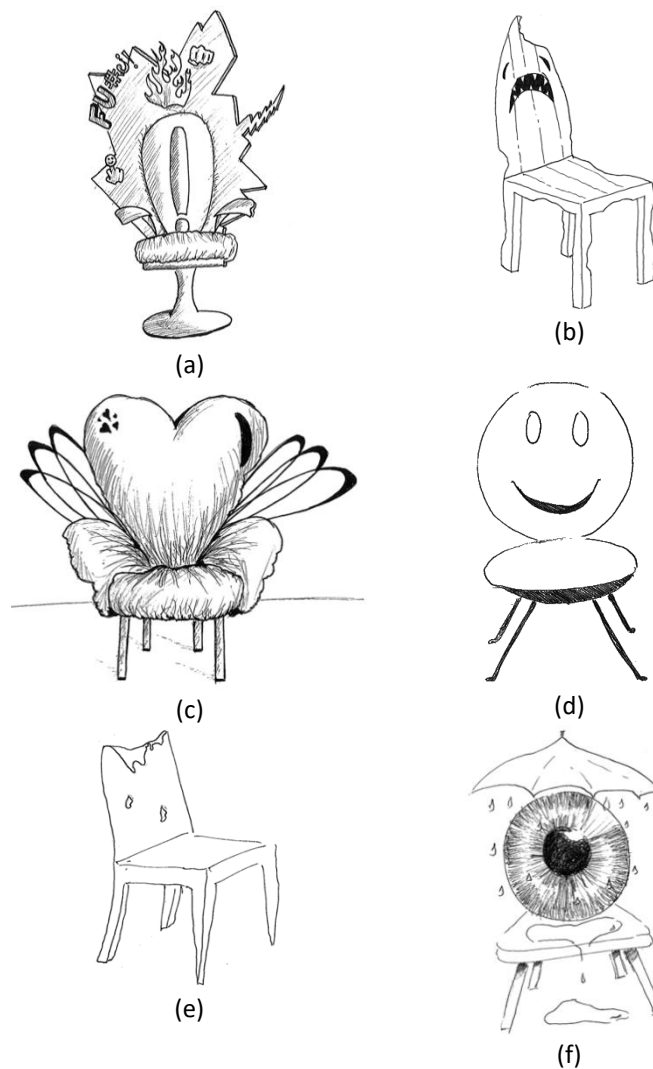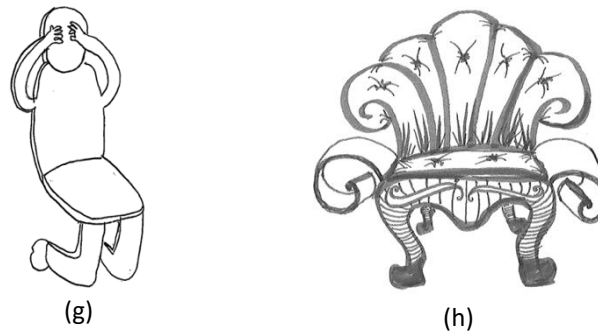
**Figure 2. Emotional chairs proposed by the students, based on Plutchik's emotion wheel: (a) Aggressiveness chair; (b) Awe chair; (c) Love chair; (d) Optimism chair; (e) Contempt chair; (f) Disappointment chair; (g) remorse chair; (h) Submission chair**

## 6. Conclusion

Plutchik's wheel of emotions was useful in this pedagogical project as a framework for early design thinking. The exercise invited junior product design students in the discipline of Drawing I to show emotions through drawing. The double appropriation of meaning, from the word and from the drawing, allowed students to train the cross-language of emotions that develops emotionally communicative shapes. Drawing allowed thinking, choosing, innovating, and putting into words often subconscious decisions, also based on emotions. The fast response allowed drawings to remain human oriented, intuitive and emotional. Thinking of emotions was useful to support and develop creativity, stimulate thinking and organising ideas and decision steps, in a hermeneutic process towards the enhancement of the final result. The academic drawing exercise also raised awareness on the symbolic meanings (sense-making) of products that surround us, making the world a better place.

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