MASK: A Visual Study on the Facial Expression Behind the Health Mask

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Abstract. This article briefly presents the work developed during the master’s degree in graphic design, in which it was investigated how design can contribute to counteract the social stigma that exists in relation to people who have to use health masks to protect their immune system, and who for this reason feel discriminated.

As part of the dissertation, and as a design strategy approach, a visual study on facial expressions was developed, culminating in a book with about 250 photographs, which aims to reflect upon the way we interpret the facial expressions that hide behind health masks.

This study uses photographs of different facial expressions of 35 people, with and without health mask, to show how facial expressions are influenced by the use of this item. In this way, it seeks to draw attention to the bias in the perception and interpretation of the facial expression of people wearing health masks. The study shows that non-verbal communication is negatively affected by the use of health masks, making it difficult to interpret the emotional state of the person wearing them.

Keywords: Health masks · Communication design · Photography

1 Socially Responsible Design

Everything is communication and we are always receiving and sending information. As such, design has an important action in helping to disseminate a message we want to convey or a belief we intend to transform.

According to Frascara [1] in communication design the emphasis should not be on the product, since it is considered only as a medium. Essentially, the designer creates the communication, projecting a certain event, an act in which the audience will interact with the design. Thus, the designer’s main goal is the creation of communicational situations. The focus, in communication design, is not the communication act itself, but the impact that design has on knowledge, attitudes and behavior of people.

Each communication product arises from the need to communicate a specific message to get a certain reaction. In other words, communication design is about getting people to do something in particular, such as change mentalities about a certain subject.

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Visual communication is fundamental in the process of exploring concepts and disseminating information. The most effective communications take advantage of the ease in processing personal information, to improve the capacity of inference, memory and understanding. Visual communication elements help the audience to quickly understand complex ideas.

Hembree [2] states that design is seen as an important tool to improve society through direct communication, challenging and influencing public opinion through political or institutional campaigns or advertisements. In this way, design makes individuals to orient themselves or build something, identifying and informing the public on a wide range of topics.

Ultimately, good communication design will be able to modify social attitudes and behaviors. Campaigns and products against stigma, for instance, seek to disseminate a more “true” image of disability in order to demonstrate that prejudices and stereotypes have no real basis to sustain them [3].

In communication design it is important that both those who develop the messages and those who receive them share the same visual reference. This is the only way to achieve some kind of individual influence and, on the whole, to influence social behaviours towards a certain issue. In this sense, the communication designer has the task of developing a structured visual interpretive scheme in order to convey the messages effectively. In order to design a good visual communication campaign it is necessary to have a coherent discourse so that it is possible to establish a connection with the public, intellectually but also emotionally [2].

Thus, there is a change in the definition of what the designer’s profession is and how it can be extended to include the possibility for designers to engage in political and institutional activities, focusing on long-term systemic solutions rather than simple problems [4].

2 Health Masks

In the context of disease or prevention, the use of health masks is very common, both for patients and health professionals. They are an important tool used to prevent the spread of disease or to defend those who are sick. For example, masks help limit the spread of germs. When someone talks, coughs or sneezes, they can release small drops into the air that can infect other people. Thus, if someone is sick, wearing a face mask can reduce the number of germs he or she unintentionally releases, thus protecting other people from getting sick. A face mask also protects the nose and mouth from splashes or sprays of body fluids, such as blood that may sneeze during surgery.

Health masks can have various denominations, such as surgical, dental, isolation or medical masks. Usually these masks are loose and cover the nose and mouth, attaching to the back of the head with ties or elastic bands.

The use of a health mask is relatively common in situations where the person wearing it poses no danger of contagion to others, as is the case with cancer disease for instance, where due to chemotherapy, the patient’s immunity is often compromised, and it is therefore necessary to wear masks in order to prevent the occurrence of infections during treatment. However, their use is associated with the stigma of the
disease and the explanation is mainly based on ignorance. As Moreira [5] points out, the use of facial masks can cause embarrassment to the oncologic patient, since, as other people do not know its purpose, they look at the mask as a protection for themselves not to come into contact with some kind of infection, leading to discrimination. In fact, one of the problems of wearing a health mask is the possibility of stigmatization, since it can lead to feelings of pity or rejection of social contact.

According to an article in the New York Times [6], medical or surgical facial masks were introduced to the operating rooms in the late 19th century but quickly became popular among the population in 1918 due to a severe flu pandemic, commonly known as Spanish flu. A century later, with the advent of modern molecular techniques it was proven that surgical masks are considered a good protection for the flu. For example, in a study conducted in 2013, researchers showed that the uses of surgical masks decreased the exhalation of viral drops by 25 times [7]. Today, due to the Covid-19 pandemic, the use of health masks has become ubiquitous and part of the daily habits of the general population.

Health masks, because they cover part of the face, are responsible for totally or partially hiding the facial expressions of individuals. Facial expressions are part of so-called non-verbal communication, which concerns to silent messages, i.e. messages that are passed on without using speech and verbal language, and involves facial expressions, gestures, eye contact, among many others.

Birck & Keske [8] define non-verbal communication as a process, usually spontaneous, using a variety of channels, involving a subtle set of non-linguistic behaviours that are subconsciously represented. Although non-verbal communication is used involuntarily in most situations, in some cases it is used consciously and strategically.

3 A Visual Study on the Facial Expressions Behind the Mask

Non-verbal communication, especially facial expressions, are an important way to communicate emotions. Emotions are a difficult concept to define. There is no universal or unanimous definition of them. This difficulty may be due to several factors, such as their complexity, the great variation in intensity to which they are subjected, their dependence on states of health, the value system and the beliefs of the subjects.

For Ekman [9] emotions are determinant for a good quality of life of individuals, and these result from the relationships that the human being develops throughout his life, with friends, family, work colleagues, among other people. For this author emotions can be classified as primary and secondary emotions. Primary emotions can be associated with universal facial expressions, i.e., present in all people, such as emotions of sadness, fear, joy, disgust, surprise and anger. Secondary emotions, on the other hand, are closely related to socio-cultural learning processes, which means that people from different cultures can express these emotions differently in the same situation [10].

According to Ekman [11], humans are able to produce more than 10,000 facial expressions, and the expression of primary emotions can be considered universal due to the consistency of muscle facial patterns found at different latitudes. Despite the cultural and linguistic differences found in a study conducted in Brazil, China, USA, Argentina and Japan, Ekman & Friesen [12] showed that each facial expression
analyzed in different countries corresponded to the same emotion, proving that the expression of happiness for instance is the same in the different locations.

For Du, Tao and Martinez [13] the richness of facial expressions lies in the fact that they consist of compositions of emotions, which allow us to express a wide range of emotional states and reactions, such as happily surprised or happily disgusted. These authors identify twenty-two categories of composed expressions built through the combination of the six primary emotions proposed by Ekman [9].

In an attempt to develop a visual study to show how the use of a health mask alters the perception of facial expressions, five photographic sessions were first held, in which five people were asked to reproduce the set of twenty-two facial expressions proposed by Du, Tao and Martinez [13], so that one could observe which facial expressions remained perceptible and which were more affected by the use of a health mask.

In these first five sessions, images of the twenty-two facial expressions were shown so that the participants could try to reproduce them with and without a mask. After this test, it was concluded that, because there were too many of them, these categories of facial expressions became difficult to interpret, leading to photographs with confusing facial expressions. Thus, it was decided to retake the test from the six universal facial expressions proposed by Ekman [9]: Anger, Fear, Sadness, Disgust, Surprise and Happiness.

The first photo session was repeated with the same people, and another session was held extending the test group to five more members. In these sessions the six primary emotions were first photographed from a verbal request and then from the attempt to reproduce six drawings of Ekman universal expressions. In this way we tried to register first a more spontaneous and individual interpretation of each emotion and then a more uniform and universal expression in a second moment.

With this second set of tests, it became evident that the six facial expressions would be sufficient, being easier to interpret by the participants and originating photographs with rich and diversified expressions, which was the intended objective, due to the way each of the participants interpreted and represented each of the facial expressions requested.

It was therefore decided to hold as many sessions as possible in the time available. A total of thirty-five participants were achieved over two months. In order to increase consistency and facilitate comparison between photographs, the same type of framing, background and lighting was always maintained in these sessions and the photographic sessions were organized in four steps which were repeated every time.

1) In the first step, the photographed person was asked for a naturally neutral expression.
2) In the second step the participant tried to express the six primary emotions verbally requested.
3) In the third step, images drawn from the six primary emotions were shown so that the participant could try to interpret and reproduce them.
4) In the fourth step the person would again express the six primary emotions with the health mask on.

After the photographic collection, a book was organized and selected in order to present the results. The choice of a book as a way of presenting this study was based on
the need to find a way to show the photographs in detail and without time allotted, giving the reader time to think and absorb their content.

For the book design process, we began by comparing the photographs of each person, trying to identify those in which the facial expressions with mask kept in the uncovered areas a greater resemblance to the photographs without mask. Thus, we tried to organize the photographs in pairs, where the same person expresses the same emotion with and without mask, so that the book would allow us to see the expression that is hidden underneath the mask (Fig. 1).

![Image](image_url)

**Fig. 1.** Sample images of fear facial expressions with and without the health mask.

The photographs that presented substantial differences in their versions with and without mask were discarded, keeping only those that presented greater similarities mainly at the level of the expression of the eyes. Also from this criterion, only one of the two unmasked photographs of each expression that were taken from each participant was chosen.

It was decided to reproduce the photographs in black and white and in landscape format where it is possible to see part of the shoulders in order to give some contextual information about the person. It was sought, from these visual options, to highlight each facial feature and simplify the reading of emotions and expressions, trying to reproduce a natural look from a person’s face while keeping the mask in context.

The observation of faces in photography is rich in details leading to the acknowledgement that facial expressions are always different even though the methodology and process of photographic recording is strictly the same.

A diverse group of people was photographed, composed of men and women of a wide range of ages. Some readers will be able to interpret some expressions more easily than others, as well as establish different levels of empathy with the different photographs according to their own experiences. Parents of young children may be able to connect more easily to children’s photographs. The wide range of ages and genders
also allows to reflect upon how these factors influence the interpretation of facial expression of a person wearing a health mask.

At the same time the book message remains the same, regardless of who sees it. Throughout the book, the faces are repeated causing the illusion of unification, the comparison of photographs is inevitable (Fig. 2).

The study shows that the use of a health mask considerably reduces the ability to transmit emotions through facial expressions, especially compound emotions, such as angrily or angrily disgusted.

Although the participants were asked to reproduce the six primary emotions proposed by Ekman, in the photographs without a mask it is evident the compound dimension of the photographed facial expressions, which arises from each person interpreting differently what each primary expression means. However, in most photographs with a health mask the perception of this subtle changes of interpretation becomes much more difficult, demonstrating a clear reduction in the capacity of non-verbal communication, especially at the level of secondary emotions, which are essential to sociocultural communication (Figs. 3 and 4).

In some photographs, even the primary emotion becomes ambiguous, which points to a greater difficulty in understanding the emotional state of the person wearing a health mask. This point in particular requires further research so that conclusions can be drawn as to which facial expressions are most affected by the use of a health mask, and whether there are any correlations with stigmatizing stereotypes.

At the end of the book, the participants are presented through color photographs and brief biographical notes, which challenge us to compare the assumptions we made during the reading of the photographs with objective data about each of the participants.
4 Conclusions

This visual book does not attempt to point out a conclusion, but rather to raise doubts and stimulate individual interpretation on how the use of a health mask alters the perception of facial expressions. Do the eyes of a happy expression still look happy when wearing a mask?

The decline in the ability to express subtle and complex emotional states associated with compound facial expressions may lead to a greater propensity to be interpreted in a stereotyped manner. Not only does the mask hide a considerable part of facial expression, hindering non-verbal communication, but it also replaces it with an element connotated with the idea of illness, which brings associated expectations and prejudices

![Fig. 3. Sample images of happy facial expressions with and without the health mask.](image1)

![Fig. 4. Sample images of sad facial expressions with and without the health mask.](image2)
that bias perception. The health mask becomes an integral part of facial expression, interfering in its interpretation (Fig. 5).

It is hoped that this study will show that, although hidden, the emotional expression of a person wearing a health mask is as complex and multifaceted as that of any other person, and that this finding can contribute to a truer and more natural view of people wearing health masks, fighting what Sontag [14] describes as a metaphorical view of diseases that are particularly resistant to treatment, such as cancer, where people become “victims”.

For Sontag [14] this metaphorical and stereotyped view of the disease establish a harmful way of life, where the patient is attributed with the final responsibility for healing, leading to the abandon of behaviors considered normal and acceptable before being ill, which become unacceptable even if they do not have any direct causal relationship with the disease.

The use of design and visual communication as tools to combat this kind of stereotype allows us to approach the complexity of this phenomenon from an apparently simple formula. By showing that expressions such as happiness, anger, fear, sadness, disgust or surprise can exist behind a health mask, one fights the perception that these people can be defined exclusively by the illness and that for this reason they are incapable of getting involved in all the activities of life.

Through this study, individual emotions and identity are highlighted, showing that they play a central role in the way that we should look at a person wearing a health mask.

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