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Contributions of Graphic Design for Effective Communication in the Health Campaigns

Contribuições do Design Gráfico para uma comunicação eficaz das campanhas de saúde

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graphic variables, health campaigns, experimental models

This research paper considers the development of instructional images in graphic materials for health campaigns to prevent and combat Dengue fever. This paper references other studies on graphic variables and imagery used in government-sponsored health campaigns to combat Dengue fever in Brazil. An experimental model is developed for the synthesis of images, optimally matched to a broad educational campaign intended for the general population. The central objective of this paper is to contribute to improving public understanding of educational campaigns for disease prevention. In this case, the graphic design plays an important role in helping to show people the characteristics of a particular disease through images that enhance communication. Graphic solutions are proposed to enhance communication protocols that promise a broader base of understanding and a graceful assimilation by the target audience, which may prevent the poorest populations - the main target of Dengue – to be affected by this illness.

variáveis gráficas, campanhas de saúde, modelo experimental

A presente pesquisa apresenta um estudo sobre o desenvolvimento de imagens instrucionais presentes em materiais gráficos de campanhas de saúde de prevenção e combate à dengue. A pesquisa abordou estudos sobre variáveis gráficas, imagem e campanhas de saúde de combate à dengue com o objetivo de desenvolver um modelo experimental para desenvolvimento adequado de imagens destinadas a esse tipo de artefato educacional, de forma a contribuir para uma correta compreensão da atividade proposta pelos mesmos – cujo intuito é o aprendizado pelo sujeito – e com isso reforçar a necessidade do trabalho de um designer no processo de desenvolvimento desses materiais. Para tal foram propostas soluções gráficas que contribuam para uma melhor identificação do procedimento proposto nesses materiais adequando-os às necessidades informacionais do sujeito.

1 Introduction

Many different types of communication modalities have been adopted by government agencies to meet communicative and instructional needs, with particular focus on health care. Informal approaches are generally used for these communiqués because they hold the promise of reaching a wider audience, and therefore, achieving a high level of success for any given communications initiative. Health education campaigns are often part of a non-formal education initiative intended to communicate vital information through different media, such as newspapers, magazines, radio, TV, and Internet, (Berbel & Rigolin, 2011).

Health information campaigns often use an educational approach for its graphic language materials with the objective of reaching the specific population towards which they are directed. Schramm (1976) references studies on mass communication where the planners

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concluded that health information campaigns using images to support educational messages are more effective because they are naturally easier to capture people's attention. It should be noted, however, that the simple insertion of images does not guarantee the efficacy of a health campaign. It is important to evaluate the context in which the visual message is inserted along with the graphic elements within it to avoid problems of misinterpretation introduced by the complexities of the visual message. Disease prevention campaigns, which use visual language, are an important component of the dialogue used for disease control. Prevention campaigns that use visual language are an important component of the official communications in disease control, both in population awareness about the work of official health agencies, as well as the emphasis on popular participation and government performance. In Brazil, despite the extensive educational and informational campaigns deployed to combat and control the spread of Dengue fever, its persistence reveals problems in effectively communicating the principle aspects of health information and allied informational models (Pitta & Oliveira, 1995).

Dengue fever is an acute infectious disease caused by a virus of Flaviridae family and is transmitted in Brazil through the mosquito Aedes aegypti. Currently, Dengue is considered a major public health problem worldwide, with four identified types of Dengue virus: DEN-1, DEN-2, DEN-3 and DEN-4 (Ministério da Saúde do Brasil, 2014)

The World Health Organization estimates that the mosquito infects 50 million to 100 million people each year worldwide, mainly in Africa, Asia and Latin America (Ministério da Saúde do Brasil, 2014). In the period 2005-2008, more than 700,000 cases were reported in Brazil (Ministério da Saúde do Brasil, 2014). The main symptom is a high fever, lasting approximately seven days, with at least two of the following symptoms: headache, pain behind the eyes, muscle aches, joint pains, prostration, and redness in different parts of the body. The most severe manifestation is Dengue hemorrhagic fever, with the following symptoms: heavy and continuous abdominal pain; persistent vomiting; dizziness when standing; bloody secretions; hands and feet take on a bluish color; rapid pulse; agitation or drowsiness; decreased volume of urine; sudden drops in body temperature; and difficulties with respiration. Both forms of the disease are severe, but the hemorrhagic form of the disease can quickly lead to death (Ministério da Saúde do Brasil, 2014).

A key objective of this paper is to develop an analysis of graphic variables that may lead to a better understanding of instructional images in materials used by government-sponsored health campaigns to inform and ultimately combat the spread of Dengue fever. Various approaches that may optimize the interpretation and the consequent adoption of prevention actions are presented in this paper. Graphical solutions are proposed that minimize the communication failures of past campaigns and promise a more effective transmittal of information to a diverse target population. In this sense, these campaigns are instruments of education intended to limit the onset of widespread health hazards through the uses of images to change behavior and potentially mitigate the onset of an endemic situation. However, it is valid to emphasize the importance of understanding the target population including their background, values, beliefs, customs and social relationships. This understanding is essential and must be carefully considered in the design and synthesis of the imagery used to communicate knowledge and information by government agencies to the general population.

It is important to understand principles of graphic language to select the most effective graphic variables for printed media campaigns. A review of relevant studies of images and health campaigns begins the discussion below, followed by studies of analytical models and graphical variables. Next, the method and analysis of current images used in health campaigns are presented, followed by the proposed model and results of the model. Finally, conclusions regarding considerations for future research are discussed.

2 Images and Health Campaigns

In modern society, various forms of communication leverage the use of images to facilitate an understanding and interpretation of the intended message. According to Estrella (2006), the term image society refers to the way we have expressed and perceived information, especially through the mass media. Also, according to Estrella (2006), the image plays important role with certain constancy of communication, because it is a visual form, capable of organizing

narratives that are always increasing and changing according to the experiences of each society.

This constant participation of the image in the context of society is due to its universal way of communicating. However, there are different types of images that the public frequently encounters in daily life, and these images can be observed through films, magazines, television and, more recently, the Internet. In this paper, the images that are being referenced are those used in print, known as two-dimensional images, since this paper focused on images taken of graphic materials (folders) from health campaigns aimed at combating Dengue, which were delivered to communities in the city of Recife, in 2011-2013.

As a symbolic way of representing reality, it is necessary that, for the preparation and use of the images of these materials, the illustrator needs to be aware of cultural differences and also their meanings regarding the interplay of visual elements. This is an essential perspective since there is always a societal and historical context unique to a specific demographic. The relative significance of these elements may vary. Gombrich (2007) explains that there are several ways to interpret an image, and this interpretation depends on the observer. The greatest challenge is to establish how these changes take place in interpretation, and this is the challenge for the designer: to produce relevant images to an extremely diverse audience.

In this sense, the use of images in the messages does not always facilitate communication and can often confuse the reader about the basic intent of the message. Coutinho and Freire (2006) observe that the images found in children's books in the Portuguese language used for educational purposes were not identified or understood by the majority of students, due to issues such as visual quality. Besides, these images were not part of the cultural repertoire of the students to whom the message was addressed.

The same was found in research on the understanding of instructive images used for prevention and combating the Dengue virus, because the public could not understand the instructions represented in the images. This confusion interfered with the execution of the task, because the instructions had failures such as (a) very small size of the images in some materials; (b) presentation of the image hindered the identification details; and (c) a lack of indication of an action that could have enhanced the proper understanding of an instruction (Borba, 2013). In this sense, some messages may have different misinterpretations of the author’s intention, due to these reasons: (a) lack of data in the message; (b) lack of the necessary background and/or education on the part of the reader, viewer, or analyzer; (c) cultural / social context interpreted differently because of the mismatch in the background of the author of the message; and (d) problems experienced by the reader, which may interfere in certain levels of interpretation (Borba, 2013). Some images may have different meanings depending on the context in which they operate, and their interpretation depends on the previous experience in which lies the aesthetic perception. To avoid some of these problems at the time of the creation of the message, it is important for the creator to study the target audience in order to know what best fits the message, according to the interpretation of the intended idea. As Aumont (2002) says, although images contain directions that must be read and interpreted by their observers, even the immediate and visible images are not always easily understood, especially if they are abstract and removed from the central context in time or in space.

Previously, health campaigns aimed at preventing and combating Dengue, which have used graphic media, have not been successful because these key factors have been neglected. The instructions portrayed in these graphic media have caused ambiguity of interpretation, and this has often led to a gross misunderstanding of the intended message (Borba, 2013). However, it is possible to use different graphical variables that can help to understand a message that is made through a pictorial representation. In this case, the designer must know the existing graphical resources that are potentially matched to the health message, as well as the social and historical background of the intended recipients of the message. This approach holds the promise of accurately communicating to the largest number of people in the region.

3 Studies of Analytical Models and Graphical Variables

Graphic variables are the graphic elements in pictorial images that can be modified to focus the message and its context. Two analytical models are presented below—Goldsmith (1984) and Ashwin (1979)—that support the selection of the variables considered in this paper, as well as the variables proposed by Spinillo (2000).

3.1. Goldsmith's Model

Goldsmith (1984) proposed an analytical model of understanding illustrations to improve image identification, because too often, the pictorial language can cause problems in interpretation of the desired message. The author bases the analysis on the semiotic study of signs and symbols and their use or interpretation levels proposed by Morris (1938) and Goldsmith (1984), such as syntactic, semantic and pragmatic symbols, to find out elements that may interfere, positively or not, in the identification and understanding of messages transmitted by illustration.

Briefly, according to Goldsmith (1984), it is possible to define the semiotic levels as follows: (a) the syntactic level is the recognition of graphical elements without identification of meanings for the image; (b) the semantic level identifies the content and meaning of the image and the literal meaning proposed by the author; and (c) the pragmatic level deals with the identification of the meaning of the image by the observers, considering their previous experiences.

Goldsmith's (1984) model, used in this paper draws from four of Goldsmith's visual factors that are relate to semiotic levels, and indication of the variables considered for this project were as follows: (a) unit - recognized by the observer of the image, even if the identity is not understood; (b) location – the spatial relationship between elements, i.e. their willingness composition involves overlapping, forms, textures, etc.; (c) emphasis – the hierarchical relationship of visual information, which relates to the attraction and directing the viewer's attention; and (d) and parallel text – the relationship between illustration and text, which verbalizes the image, i.e., it describes in words what is graphically represented.

3.2. Ashwin's Model

Another graphical analysis model studied was that of Ashwin (1979), who developed an analytical model considering the concept of style as semantic content, because graphical syntax changes result in changes in the meaning of the image. The model, based on syntactic and semantic features of images, considers seven variables that characterize the style and considered for proposed graphical improvements: (a) consistency - homogeneous or heterogeneous image representation, i.e. the representation techniques used in preparing these images; (b) gamma - use of several syntactic possibilities in the image, that is, the syntax is affected by the magnitude of the chosen medium effect; (c) framework - provision of pictorial image and self-supporting; (d) positioning - organization of image components in a symmetrical way, when there is an order, or casual, when there is some randomness in the distribution; (e) proximity - scale of the image components; (f) kinetics; and g) naturalism.

3.3. Spinillo's Variables

Considering the instructional content of the images in this present study, it is important to address and use the studies developed by Spinillo (1999, 2000), related to sequences representing procedures. Her studies were used as a basis to propose a list with graphics that facilitate the understanding of the images with necessary adaptations for the purposes of this investigation.

According to Spinillo (1999, 2000), there are eight types of graphical representation of variables that are part of this language and, depending on the form of presentation, may affect, positively or negatively, the understanding of a message. These graphical representations include: (a) display of text - the text suggests that graphical content is located as close as possible to its related text (e.g. caption, text and / or label); (b) layout of pictorial sequence - how the sequences of pictorial images are aligned and arranged in graphic material (e.g. horizontal, vertical, oblique, circular and branched); (c) guiding reading - are used to explain and facilitate understanding of the sequence of graphic images, aiding the correct reading of the PPS - Procedural Pictorial Sequences (e.g. numbers, arrows, letters); (d) elements of visual

separation - resources used to visually identify each graphic image in isolation, allowing demarcation of the area of representation (e.g. space, lines, edges); (e) symbolic elements - used conventions that have become representation of something, which may indicate denial/prohibition or possibly symbolize elements that are present in the repertoire (e.g. arrows, diagonal); (f) emphatic elements - graphic resources used to emphasize particular elements, attracting the attention of the reader or indicating a detail in the image (e.g. shapes, colors, elements that draw the reader's attention or show details of the illustration); (g) illustration style - forms used for graphic images representation (e.g. photographic, design, schematic, shadow); and (h) figure representation - contents of the represented object that may be a fragment or the totality of it (e.g., partial and / or full graphics).

Considering the graphic resources analyzed, it was observed that some of them work effectively with some representation of the instruction, facilitating the identification and understanding of the message.

4 Method and Analysis

To perform this research, a literature review was conducted. The current model used in official health campaign literature consists of four images (Figures 1, 2, 3, and 4) have been used for prevention and /or minimizing the spread of Dengue viral disease, in the region of Recife, (northeastern Brazil) during the period of 2011 to 2013. The proposed model consisting of four different images (Figures 5, 6, 7, and 8) were tested to determine whether they are better suited to a diverse audience.

Figure 1 - Representation of the instruction to put sand in the broken glass. Source: Ministério da Saúde do Brasil, 2014.

Figure 2 - Representation of the instruction to remove accumulated water from the leaves. Source: Ministério da Saúde do Brasil, 2014.

Figure 3 - Representation of the instruction to capsize bottles. Source: Ministério da Saúde do Brasil, 2014.

Figure 4 - Representation of the instruction to keep the toilet lid closed. Source: Ministério da Saúde do Brasil, 2014.

The selected images above were evaluated based on analytical models of Ashwin (1979), Goldsmith (1984) and Spinillo (1999, 2000), in order to identify the graphic variables to be manipulated or be included for better identification and understanding of instructional action This list of graphic variables was analyzed to determine a new model consisting of variables considered effective. In the current images, graphic elements representing motion were not identified; additionally, images are not presented in sequence. The absence of these characteristics complicates an understanding of the image as statement / action. Therefore, the proposed model adds motion and sequence to the images, since, according to studies shown by Souza and Lima (2010) and Spinillo (2000), there is a better understanding of the activities when these elements are inserted to pictorial images.

Other variables were considered in the development of the proposed model: (a) homogeneous representation, because the image will be drawn only by digital technique; (b) limited range, as there will be further synthesized representations; (c) conjunctive framework, enabling the subject to perceive in what context / environment the main object is inserted; (d) presence of an individual, in order to facilitate the identification image that represents an action; (e) motion representation by graphical symbols, showing the direction that the movement should be done; (f) pictorial sequence, to show the process of the procedure; (g) color, to differentiate the elements inserted in the images; and (h) numbers, for reading orientation.

4.1. The Proposed Model

The proposed images are an improvement upon the current images found in official government campaigns intended to combat dengue fever. Figures 5, 6, 7 and 8 represents instructions with respect to the inserted graphic materials in health campaigns. Modifications were made to images so that they closely follow the design principles of Goldsmith (1984), Ashwin (1979), and Spinillo (2000). The goal was to make communication more efficient, and thus stimulate broader participation by the general public.

Figure 5 - Redesigning instruction to put sand in the broken glass, with the use of variables. Source: Elaborated by the author, based on survey.

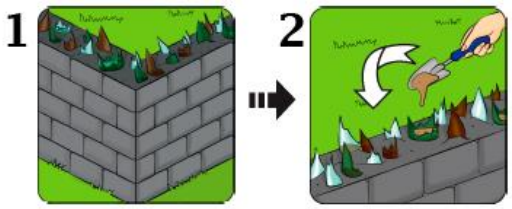

Figure 6 - Redesigning instruction of taking accumulated water from the leaves, with the use of variables. Source: Elaborated by the author, based on survey.

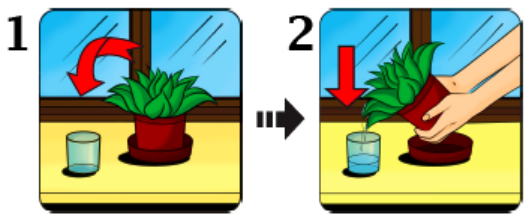

Figure 7 - Redesigning the instruction to turn bottles upside down, with the use of variables. Source: Elaborated by the author, based on survey.

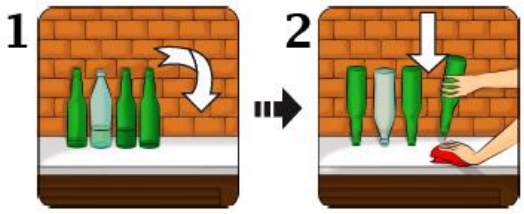

Figure 8 – Redesigning the instruction to keep the lid closed, with the use of variables. Source: Elaborated by the author, based on survey.

Accumulated water in different containers or locations creates an enabling environment for the proliferation of the dengue mosquito eggs that cause disease. In this sense, most images relate to the problem of water accumulation and the lack of information so as to avoid causing the disease. Certain visual elements, according to several authors, may be treated as variables that can be optimized to make the most effective graphic language. According to Spinillo (2000), the use of an arrow as a guide facilitates the correct viewing order of images, showing a sequence. According to Souza and Lima (2010), an arrow on the image itself facilitates understanding of an action, as well as the direction and origin can be identified respectively by the tip and the tail, for better understanding the beginning of the statement. Also, Arnhein (2005) states that the perception of motion is given by successive representation of events / objects. This is as also noted by Spinillo (2000), who suggests that the perception of the activity occurs most successfully when the viewer can understand all steps of a procedure, from start to finish. Finally, Ashwin (1979) explains that a disjunctive framework is an important variable that can be effectively used to highlight the main focus of the message, emphasizing it, and facilitating its identification by the observer.

Modifications were made to images with the intention of using the information design approaches to improve communication with pictorial representations of procedures that needed to be followed to prevent and combat Dengue. Of course, the goal is to develop a familiar visual identity to make communication more efficient, and thus stimulate broader participation by the general public.

5 Conclusion

The complexity of developing a mass communication, due to the diversity of the target audience (Shramm, 1970), is that often the public health campaigns present ambiguities and difficulties in understanding the message, especially when there is a persuasive component, suggesting a change in perception about a specific subject. To mitigate this problem, the use of images in printed materials is presented as a more effective communication technique, especially for a diverse audience (Spinillo, 2000). This research indicates that the simple inclusion of this feature, while necessary, is not sufficient in itself to achieve the desired understanding of a health communiqué, since it was not generally suitable for the intended audience.

Gombrich (2007) considered the importance of developing a visual message, as well as knowledge about the target audience. Therefore, given these findings, this paper shows not only the importance of knowing the target audience for the messages regarding their culture, customs and social conventions, but also the importance of a professional who is capable of synthesizing and developing appropriate imagery that is well matched to the intended target population.

It is clear that a message does not function alone, and the intended message could not have its intended communicative value if the context is mis-directed. With an appropriate analysis of images, it was possible to determine which graphic elements could be manipulated to effectively communicate specific procedures.

Efficient production of pictorial images requires the application of guidelines for choosing the context in which the pictorial images will be used as well as the selection of the conceptual theme that must be followed. To achieve these goals, Mijksenaar and Westendorp (1999) outline salient questions that should be answered during the design and synthesis process of these materials, such as: What will be explained in the images? What images are used? How will the audience likely interpret the message?

Elements that, in principle, are part of the repertoire of public campaigns and tend to facilitate recognition and understanding of the visual message were selected. Based on an analysis of the findings, it is possible to propose guidelines for the use of images in educational and environmental material that facilitates their understanding. Far from intending to present a list of recommendations, some considerations for the development and use of images in such materials are as follows: (a) Arrows - since they refer to images that indicate the subject actions / procedures to be performed, using this feature facilitates the understanding of dynamic content, and arrows replace some verbs (e.g. closing and opening) of the procedures represented; (b) PPS (Procedural Pictorial Sequences) - representation of the action using sequenced images facilitates the identification of the steps of the task that subjects should perform, as this feature makes it possible to identify the beginning and end of the procedure; and (c) Color - this feature makes clearer the difference between each object represented, and facilitates the identification of depth, differentiating each element, and making the perception of action more obvious.

Therefore, it is possible to verify the importance of the role of visual instructions, as there is a set of informational guidelines about the procedure related in various areas, such as recreation, health, safety tasks, demonstrating its importance in the public.

Finally, this research paper is intended to stimulate further research about information design that is matched to the social norms of the target population, thus contributing to improvements in the use of imagery specifically related to health campaigns.

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