Jean-Éric Pelet*

# Effects of colours on the attitude towards an e-commerce website: A multicultural approach

K e y   w o r d s: colour in e-commerce, national culture, attitude towards the website, affective states, buying intent

S u m m a r y: The aim of this research consists of studying the effects of the colours on the formation of an attitude towards an e-commerce website according to the nationality of the user. Colours used at the website can be a major element in the design of the interface by introduction of easily identifiable areas within the website. On the basis of semi-directive interviews, informations about French and Tunisian Internet users were obtained to identify their perception of the interface of e-commerce websites. The topics referring to the national culture and to the affective states experienced by the consumer in the context of shopping on the Internet emerged. The findings reinforce the effects of the colour variable by consumers. They also show differences of perception according to the country of origin.

## 1. Introduction

This work focuses on the central question of the role of colours on e-commerce and their influence on shopping behaviour. We also outline our objectives. Subsequently, the concepts of colour and culture will be discussed, as well as works on affective states in the context of shopping over the Internet. In order to know what are the differences of perceptions between Tunisian and French consumers, depending on the colour of e-commerce websites they visit, results of an exploratory study conducted jointly in France and in Tunisia will be discussed. This presentation will conclude by stating the limitations of this preliminary work before reaching a conclusion. We also briefly mention the laboratory experiment currently underway.

* Jean-Éric Pelet, PhD—assistant professor, KMCMS™, IEMN-IAE, Nantes University, Chemin de la Censive du Tertre, BP 52231, 44322 Nantes Cedex 3, France, tel.: +33 06 30 53 69 76, e-mail: je.pelet@gmail.com.

## 2. Cultural aspects

Culture seems to have a significant impact in the use of information systems especially with the popularization of some of its uses such as e-commerce. However, websites have different navigation systems and different colour codes. These websites do not appear systematically designed to match the national culture of the user that they target. This variety of interfaces first raises the question of the effectiveness of these e-commerce websites based on Internet cultures. It also asks questions about intentions that this variety suggests to users, according to their national cultures.

So the question we ask is: 'What are the effects of colours of an e-commerce website on the shopping intention, taking into account the presumed mediator effect of the national culture and emotional states of consumers?' Answers to this question will contribute to our knowledge about the culture of consumers when shopping online.

## 3. Effect of colour on e-commerce

Talking about colour refers to the physiological sensation received through the eye of the vision of a colourful element. This sensation is linked to three dimensions: the nature of the object, the ambient light, the perception of the eye of the stimulus and what it communicates to the brain. Generally, colour is defined by three components: the tint or hue, saturation, brightness.

On a website, colour takes part of what is called the interface. The latter consists of processes including colours, animation, audio, text, animations, photographs, textures, graphics and advertisements, which are used to attract the attention of the user. The interface on a website is the graphic design, composed of two colours: foreground colour and background colour. They allow to reveal the contrast, which corresponds to a marked contrast between a foreground and a background colour. The perception of the ambiance of an e-commerce website is therefore almost entirely based on its visual aspect that is to say, the graphic, since 80 percent of the information processed by the brain of the learner comes from view (1).

By appealing to colours, we clarify the conceptual framework of this paper on the concept of atmosphere. The atmosphere of an Internet website corresponds to its shopping environment. It represents all components of the website involving the visual and auditory ability to stimulate the senses of the user. It helps to understand his/ her emotional, cognitive, psychological, physiological and behavioural changes by the modification of one of these components (2).

However, studies on a single variable of the atmosphere of an e-commerce website remain rare. They do not include the effects of each of them accurately. Furthermore, few studies in marketing seem interested in comparing the use consumers make according to their culture in the context of electronic commerce.

## 4. National culture and perception of colour on the web

Culture can be defined as 'a collective mental programme and a set of interactive aggregates of common characteristics that influence the collective response towards the environment'. Its study can be done at several levels:
 – a national reference to the country of affiliation of the individual;
 – a level of membership in a regional, ethnic or religious group;
 – an organizational level studying the culture of a company;
 – a level linked to the membership, occupation and education levels of a social class.

During this research, we use the term *culture* to describe the national culture of a country. This choice permits to exclude differences between cultural groups within a nation such as those taking as support the region or social class, with reference to the presentation that has been made. The interest in studying national culture is justified by the increasing worldwide cultural heterogeneity, particularly due to the development of both international trade and the Internet. To reflect the diversity of cultures, we follow an intercultural perspective to integrate both the similarities and differences between countries (3; 4), which better underscores the complexity of culture and therefore leads to a better understanding of consumer behaviour.

Research in the field of study on the Internet confirms the influence of national culture on the behaviour of Internet users. Singh and Baack (5) show that e-commerce websites are not culturally neutral: they convey the cultural orientations of a country. Fassotte et al. (6) arrive at similar results by finding that cultural differences determine the attitudes of consumers in relation to their websites use. Violino (7) indicates that these cultural differences incorporate the obstacles that firms involved in e-commerce websites face, especially at the international level. These differences become increasingly important to take into account during the design phase of the e-commerce website.

Blake and Neuendorf (8) found that the Americans, Canadians, Austrians, Iranians and Taiwanese differ in their preferences of elements and characteristics to include in this type of website. Despite these cultural characteristics observed between countries, some companies which have developed e-commerce websites have apparently failed to grasp the importance of the national culture of the user (9). The companies which seem to have understood the role played by culture are Japanese firms. They change both the information content of their website and the elements of design based on the target market (10). This idea is supported by Fassotte et al. (6) who believe that an e-commerce website reflecting the characteristics of a culture is preferred by its users when making their purchases.

These studies confirm the impact of culture on the behaviour of Internet users and consumers. They draw attention to the importance of design elements of a website. Among these, the choice of colours which compose it. This variable is significant as it is

strongly influenced by culture. Indeed, colours convey different codes depending on the cultural contexts (11). In this regard, examples abound. White symbol of happy events in the West, represents the colour of mourning in China. The latter is associated with yellow in Mexico and purple in Brazil. Green is the colour of freshness and good health in the United States. However, this colour is associated with disease in countries where natural forests still exist. In Muslim countries, it is related to Islam and to the Prophet (4).

Thus, the study of the effects of colours of an e-commerce website according to the culture seems based on psychological aspects. Colours have a power on affective states and emotions can condition the perception of interface on users. Secondly, culture can modify the internal states experienced by users, resulting in differential behaviour.

In addition, on a physiological level, muscular tension, relaxation or muscle tone functions vary according to different colours (12). Warm colours like reds and oranges are stimulating, while cool colours like blue and green are relaxing. Now we know that colour perception varies across cultures, which can cause varying behavioural responses according to this variable.

The creation of an e-commerce website used by audiences of diverse cultural origins raises the question of its ownership, its ease to be understood and used. If it is difficult to read for content or navigation mode, because of cultural differences between the web designer responsible for the choice of colours and the consumer, the content of e-commerce website can quickly appear unattractive. If the website is not perceived as user friendly because the cultures of the web designer and consumer are different, and thereby, graphical choices in terms of colours differ between them, there might be some loss of visitors, if they dislike the graphic chart for example.

## 5. Affective states seem important too on the Internet

In addition to cultural considerations that may affect the navigation of consumers on an e-commerce website, we believe that affective states are also important. Recent studies show the increasing interest that takes into account the affective states experienced during a shopping on the Internet (2; 13).

As part of this work, we chose to limit the affective states to emotions and moods. These states indeed relate to the most illustrative ones (14). An emotion associated with a colour can be perceived as positive or negative depending on the experience of the individual with this colour (15). Moreover, during their experiment conducted in a traditional framework, Valdez and Mehrabian (16) show that the green colour (green--yellow, blue-green and green) induce the largest reactions to stimulate the participants. These results are part of a study addressing the correlation between colour components, hue, brightness and saturation, and dimensions of emotion (pleasure, arousal, dominance). Regarding moods, Ziems and Christman (17) show that they affect the perception of exciting colours. Similarly, different colours evoke different moods. This could

explain the association of mood with colours: red with excitement, as a stimulant, yellow with gaiety, as a neutral response, and blue with peace, as a relaxant (18). Examples cited above demonstrate the importance to study the role of affective states in the context of e-commerce websites. Information obtained from studying affective states can enable managers of companies to segment their markets more effectively while managing supply and communication on the basis of proven results.

From the foregoing, we have formulated the following hypotheses:

**H1**: The components of 'hue', 'brightness' and 'saturation' of colours of an e-commerce website positively affect the national culture of the consumer.

**H2**: The national culture of the consumer shopping experience on the Internet positively influences buying intentions.

**H3**: The components 'hue', 'brightness' and 'saturation' of colours of an e-commerce website positively influence the affective states of consumers.

**H4**: Affective states experienced by a consumer while shopping positively influence his/ her Internet buying intentions.

## 6. Hypothesis, conceptual model and methodology

The assumptions that we propose to measure in the confirmatory analysis are identified on the following conceptual model of research (Figure 1).
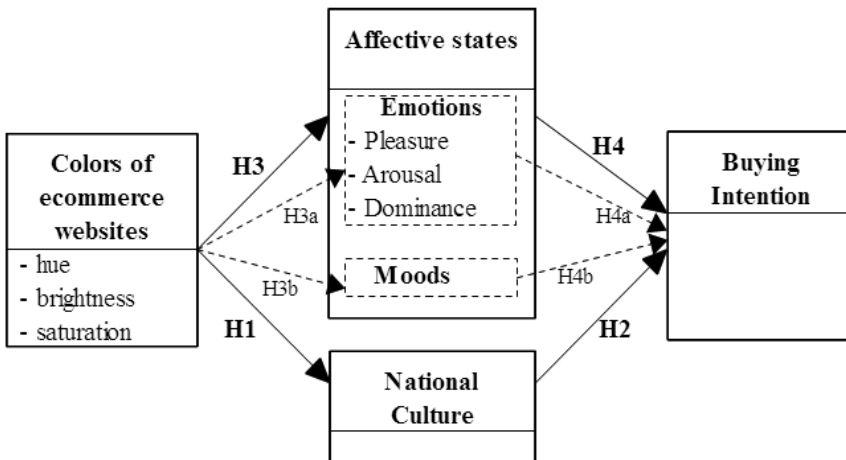


Figure 1. Conceptual model of research

Source: Author's own study.

In order to test the presented conceptual model, two exploratory qualitative analyses have emerged as necessary prior to the experimentation. The first study relates to cultural aspects and the second to the consumer's experience on e-commerce web-

sites. The first study was conducted to identify cultural variables involved with the intention to purchase online, especially in the absence of a unifying research framework. The second aims to collect information about Tunisian and French Internet consumers, and their perception of the interface of an e-commerce website. This is a particularly recent research area. In regards to the criterion of saturation of data being retained (19, p. 114), we interviewed for the first study 12 French and Tunisian people individually to identify cultural variables that influence consumer behaviour. Based on this selection criterion, we asked for the second study 24 individuals, in order to gather information on Tunisian and French users, and their perception of the interface of an e-commerce website when shopping on the Internet.

The average duration of interviews ranged from 10 to 45 minutes. These interviews were transcribed and a content analysis has been conducted. We thus obtained a transcript of 72 pages for culture and 96 pages describing the experience of the subjects when using the Internet. Other atmospheric variables than colour such as typography, animation, images or quality of the photos have been raised during this phase of exploration. However, interviews have mostly found that colour was the most cited element of websites atmosphere, in Tunisia as well as in France.

The colour is cited by all respondents as the main means of identification within the website interface. Colour helps to organize information. Colours are seen as aid to navigate the site. They sometimes cause discomfort if they seem too violent regardless of the culture of the respondent. The colourful appearance can cause a sensation of pleasure with the pleasant side it provides, when it is chosen with care. On the other hand, the fatigue which corresponds to a decline of the cognitive performance exists, for users who spend some time on an e-commerce website. Three main reasons seem to be the cause:

– firstly, the difficult readability of the page, due to the layout that is the interface design;
– then, some areas may be difficult to locate for example. This causes delay in its progression which then induces a state of fatigue;
– finally, the systematic registration on websites to be able to continue exploring the information is not very popular among respondents.

The conclusion that can be arrived at is that colour can be a major element in the design of the interface by the introduction of easily identifiable areas within the website. The successful use of contrasts reinforces this aspect, especially when reading the information provided on the site.

## 7. Results

The results we found depend on the respondent's national culture. This guides our future research in order to:

– strengthen the interest to extend this exploratory analysis with a confirmatory one;

– show the importance of considering affective states experienced when surfing e-commerce websites;
– show that the buying intention may be affected by the national culture of a respondent.

## 8. Limitations and future possibilities of research

We recognize that this study is not without limitations. Firstly, in regards to the main variable that we want to measure: buying intention, there are differences between the two cultures. Electronic commerce is not as developed in Tunisia as it is in France. The Tunisian respondents do not surely have the same experience with Internet purchases as the French ones do.

Furthermore, the independent variable of our research on the perception of colour is primarily known to vary according to culture. In other words, a Tunisian living in a sunny climate much of the year, in a country where ocher and yellow colours, that is to say hot colours prevail, will distinguish and respond to colours differently than a French, more accustomed to the monotony or to uncertain climatic conditions, causing often colder coloured landscapes. Their answers, given the time spent in each country since their birth, may vary during the interviews we conducted, depending on such considerations.

For these reasons, we will try to provide each respondent, Tunisian and French, with the same experimental conditions so they can answer to the questions issued from psychometric scales that we wish to test during the confirmatory analysis.

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# Wpływ kolorów na stosunek do handlowej strony internetowej. Podejście wielokulturowe

S t r e s z c z e n i e: Kolory wykorzystywane w projektowaniu stron internetowych mogą stanowić istotny element ich użyteczności, wyznaczając łatwe do identyfikacji obszary tematyczne portalu. Celem przedstawionych w artykule badań jest analiza wpływu kolorów na kształtowanie się stosunku klienta do handlowej strony internetowej w zależności od jego narodowości. Wykorzystując technikę wywiadu częściowo ustrukturyzowanego, uzyskano informacje o sposobie postrzegania stron internetowych prowadzących e-handel przez francuskich i tunezyjskich użytkowników internetu. Dostrzeżono problem uwarunkowań kulturowych oraz stanów emocjonalnych doświadczanych przez konsumentów w odniesieniu do zakupów internetowych. Wyniki badań potwierdzają wpływ koloru na konsumentów; pokazują także różnice w odbiorze strony w zależności od kraju pochodzenia użytkownika.

S ł o w a  k l u c z o w e: kolor w e-handlu, kultura narodowa, stosunek do strony internetowej, emocje, planowanie zakupu