Sentiments, Attitudes and Behaviours in the Context of Sustainable Design

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ABSTRACT

Semantic analyses (which included graphical symbols) explored the relationship between sentiments, attitudes and behaviours in YouTube videos about sustainable design. Comments on top videos in English and Spanish were analysed to find most frequent words, co-occurrence between words and topics. Results showed topics like energy and architecture, with notions of system, community, integral knowledge and a focus on problem solving in both languages. The English data set frequently showed words related to future, technology and cities in a male-centered world. In contrast, the Spanish top words versed on communication, cordiality, animal welfare, materials and a slightly more balanced gender presence. Graphical representations for arousal (!) were the most frequently found in both data sets, followed by communication, and calculations related representations. Also, happiness emoticons were the most frequent. There was a constant mention of economic and social barriers in the adoption of sustainable design, in contrast with former studies which have discussed lack of time and apparent benefits in adopting such methodologies.

1. INTRODUCTION

Social Networking Sites are services that store personal data in order to facilitate communication and information sharing between the users. In such services, inbound groups wield more influence on attitudes, norms, behaviour and decisions than outsiders (Cialdini, 2001), which enables the study of community behavior without relying on self-reports. In the case of online videos, weak positivity is the most common sentiment in related comments, while negativity is associated with the densest discussions (Thelwall et al., 2012). In contrast with semantic analysis software, sentiment analysis software has focused on emoticons, which tend to emphasize the emotion reflected in words. Some studies propose a universal meaning for emoticons (Gruzd, 2013), while others state the opposite (Park et al., 2013). Nevertheless, the importance of context in the emoticons meaning might be relevant (Kelly, 2015), while only a few studies incorporate other graphical representations to the sentiment analysis (Novak et al., 2015).

At a global level and specifically in developing countries, there is a lack of in depth knowledge of attitudes and sentiment among sustainable designers, academics and other stakeholders. Pro environmental behaviours that involve the design process are largely unknown. Also, the study of negative emotions which might be more relevant to prompt behavioral changes (Ahn, 2010) is being neglected in favor of positive emotions. Therefore, this study explores: a) Behaviours, attitudes and feelings related to Sustainable Design expressed by YouTube communities in English and Spanish; and b) Contextual factors related to environmental behaviours, attitudes and feelings.

2. METHOD

2.1 Description of the Datasets

We considered YouTube videos in English and Spanish from a previous study on Sustainable Design related social networks (Vargas and Yamanaka, 2016). In the case of English, comments from most commented videos with at least 8,000 views and degree centrality equal or higher than one were extracted with YouTube Data Tools (Rieder, 2015); while in the case of the Spanish video dataset, comments from the most commented videos with a degree centrality equal or higher than one were extracted. Comments were revised to discard other languages and spam; thus, 13,957 comments from 163 English videos and 1,351 comments from 147 Spanish videos were considered for analysis.

2.2 Semantic Analysis

Semantic relationships represented by concepts are analysed through keywords (Sowa, 1987). ConText software (Diesner, 2014) calculated word frequencies, word co-occurrences and topic modeling. Relevant words were classified under a basic scheme of subjects/nouns, adjectives/emotion/cognitive related words, verbs, direct objects/topics, time/place related words, graphical symbols, and measures. Next, semantic networks for the top frequent words were drawn with Gephi (Bastian, 2009). As software can only interpret alphanumeric characters accurately, identifiers were assigned to each special character and graphic representation to incorporate them to the analysis. For example, the emoticon "☺" was substituted with "gsgrin38". Also, several identifiers were assigned to polysemic symbols like "*" and "-".

3. RESULTS AND DISCUSSION

Table 1 shows top keywords in terms of frequency. It is noted that expressivity and communication are greater in the Spanish words.

Table 1. Most frequent words.

English Word	Freq.	Category	Subcategory	Spanish Word	Freq.	Category	Subcategory
you	8880	1	pronoun	gsexc1 (!)	706	6	symbol
I	8872	1	pronoun	no	463	2	negative
gsexc1 (!)	4769	6	symbol	gracias	258	2	emotion_gral
not	3964	2	negative	sí	250	2	emotion_gral
have	3890	3	connector	puedo	179	3	connector
we	3742	1	pronoun	video	166	4	unnatural
people	2944	1	noun	casa	164	5	place
they	2837	1	pronoun	mi	163	1	pronoun
will	2802	3	connector	su	161	1	pronoun
he	2733	1	pronoun	youtube	147	5	place
like	2423	2	cognitive	hola	141	2	emotion_gral
would	2394	3	connector	saludo	140	4	unnatural

While top English words included terms related to science and holistic discussions ranging from politics and economics to art, Spanish words were more focused on design applications. Concepts connected to design in English included intelligence, personal and value; while in Spanish, cheap, social and vertical were important notions. Beauty was not particularly relevant in terms of design. As for the conceptualization of designers, the second network in Figure 1 shows that architects were connected to other creative, science, management and government related professionals, while designers were not connected to business or government in the case of English. The first network shows place related words in Spanish, revealing the importance of micro locality for this network (such as villages, towns, gardens, etc.). Representations for arousal (!) and communication were the most frequently found in both datasets, followed by calculations and money representations, which suggests a frequent mention of the economical barrier in the adoption of pro environmental behaviours. Emoticon representations of happiness were the most frequently found. However, anger related emoticons were the second most frequent in Spanish, while in the case of English, it was neutral (awe, doubt) related emoticons.

Figure 1. Selections of places in Spanish networks and nouns in English network.

4. CONCLUSIONS

The economical and social barriers for the adoption of sustainable design were the most frequently mentioned. In the case of English, some notions of ecophobia and the apparent lack of sustainable design's effect were present, while in the case of Spanish, lack of resources and contextual information were present. Overall, the inclusion of graphical representations in the analyses contributed to the understanding of written expression particularly in the case of the Spanish dataset, which is considerably smaller than the English dataset. Semantic network analysis proved useful to explore relationships between attitudes, emotions and behaviours related to creative endeavours. Also, the role of some negative emotions in the rejection/adoption of sustainable design (fear in English and anger in Spanish) was uncovered. However, further analysis focused on sentiment would be useful to deepen the understanding of the interplay of such attitudes, emotions and behaviours in written communication.

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