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Abstract. We reanalyzed data from three studies to explore first-impression cultural congruency effects and potential rating scale biases among Canadian and Taiwanese/Chinese participants judging visual appeal of homepages. The objective was to identify variables likely to affect such judgments for future studies in a new research program. Some support was found for both issues and pointers for refinements of future studies were identified.
Keywords: visual appeal, cultural congruence, first impression

1. Introduction

Interest in cross-cultural user interface design is growing in the HCI community [1]. Studies of the ways companies, governments and universities present themselves on the Web reveal considerable differences between cultures. For example, web sites in collectivist cultures such as Japan and China, use more graphic elements than web sites representing individualistic cultures such as Germany and North America [2]. They differ also in the use of symbols, images, and layouts. Chinese homepages, for example, are often divided into numerous spaces; North American sites are typically arranged around one focal point [3]. However, as culture continues to evolve, the persistence and importance of these cultural differences remain unclear. Some researchers argue in favor of localization of e-commerce web sites even in the current climate of globalization, to ensure visual congruency with different cultures. Since taste changes dynamically, the cost of website localization would be a never-ending task. If people from different cultures also vary in their use of rating scales, the reliability of visual appeal assessment becomes problematic.

Data from the studies included here were analyzed to identify cultural congruency effects and potential rating scale biases in the first impression of homepages from different cultures. If cultural congruency matters, culturally congruent images should attract higher visual appeal ratings than incongruent images. Likewise, if findings show

evidence of inter-cultural response biases, then we need to understand how to control or eliminate such biases in future studies. A response bias is a tendency systematically to respond to a range of items on some basis other than what the items were intended to measure [4]. These have been studied extensively in the cross-cultural literature [e.g. 5]. Next, we introduce the notion of cultural congruency, followed by an outline of rating scale biases and then by the analyses of three studies. A general discussion emphasizing future work is then presented..

1.1 Cultural congruency

Interest in cultural congruency in website design is increasing [6]. Among researchers favoring localized Web design, Noiwan and Norcio [7], for example, note the importance of "empirical investigations on the impacts of cultural factors on interface design" (p. 104). Likewise, [6] argue that "designers should adopt a regional strategy" to reflect user preferences "in various geographical markets" (p. 582). Yet, [8] noted signs of cultural convergence in the way IBM presents itself on the Web, by keeping "the same colors and layout for all localized websites" (p. 1259). This trend is now evident in many global company websites (e.g. HP, Acer). This homogenization, contradicts Simon's [9] assertion that a single "universally appealing global site does not appear feasible" and that companies should "instead create culturally, consumer- specific sites" (p. 32). However, as Gutiérrez and Rogoff [10] note, people participate in dynamic cultural communities in "overlapping ways that change over their lifetimes" (p. 21). The early sociological literature showed that we all adopt different roles in many contexts [11]. Most of our participants belong to a particular student community, to the loosely coupled Internet user community, as well as to other groups. This self-identification with different cultural communities might influence Web design preferences, suggesting that website localization may not be as urgent as localization advocates argue.

1.2 Rating scale response biases

Response biases have been studied in social psychology, personality, and in psychological assessment since the 1940s [e.g. 12], and in cultural studies since the 1960s [13]. Biases have even been found in populations assumed to be relatively homogeneous, such as comparisons of Northern and Southern Italians [14] or Eastern and Western Europeans [15]. Adding studies involving cultures known to differ considerably exacerbates the difficulty of solving the response bias problem. Experimental and statistical control methods have been devised to deal with it, but these are far from always successful [4]. For the purposes of this paper, we reanalyzed data for evidence of three response biases that could affect first-impression judgments of visual appeal. The extremity bias, or 'Extreme Response Style' (ERS), a tendency consistently to select the end points of a

rating scale, has been demonstrated in several cross-cultural studies. North Americans are typically found to use the endpoints of rating scales more often than East Asians [e.g. 16]; East Asians tend to select the midpoint of the scale more often [17]. Extreme responses reflect decisiveness and sincerity in some cultures; in others, using the middle of the scale would be seen as attempts to hide one's true feelings. In Asian cultures, cautious responses are seen as modesty; using the extremes of the scale would be in 'poor taste'. These differences reflect variations in emphasis on sincerity versus emphasis on modesty. Both ERSs and the social desirability bias could thus represent socially desirable responses depending on participants' native culture and/or on the degree to which people engage in impression management [18]. Either way, socially desirable responses reflect a desire to 'look good'; they can distort research findings and lead to suboptimal webpage design decisions. The acquiescence bias [19], also called the 'agreement bias' [20], is the tendency to agree with questions regardless of content. Acquiescent responses appear to be more pronounced among people in collectivist cultures. Our study paradigm [21] involved Canadian and Taiwanese or Chinese participants judging the visual appeal of North American or Taiwanese/Chinese homepages in two trials in all three studies presented here. Ratings were made on a 9-point scale (1= least, 9=most appealing). Different stimulus-exposure times were used, but the present analyses only compared average ratings by culture in 50ms trials, collapsed across the homepages in the respective sample.

2. Study 1

Some 50 Chinese and Taiwanese homepages representing the 25 most- and 25 least appealing exemplars of a larger sample of wide-ranging web genres and judged independently were shown to 80 convenience student participants at a Canadian and a Taiwanese University (40 Chinese, 40 Canadian). Visual appeal ratings differed significantly by culture, $t(78)=1.98$, p=.026, confirming a cultural congruency effect.

   The frequency of ratings of 1 through 9 was calculated by culture as shown in Figure 1 below. A tendency for Canadians to give low ratings more often than the Chinese participants suggests a trend towards an ERS bias for low scores, but none of the independent t-tests conducted separately for scores of 1, 2, and 3 was significant. This pattern also suggests acquiescence among the Chinese participants. Alternatively, the Chinese participants may simply have liked these culturally congruent homepages more than Canadians. Further evidence for acquiescence lies in the observation that the Chinese participants gave more ratings at the high end of the scale. Independent-samples t-tests performed on ratings of 7, 8 and 9 thus differed significantly on ratings of 7, $t(78) = 2.05$, $p < .05$ and 8, $t(78) = 2.43$, $p < .05$. Evidently, the ERS was confined to one end of the scale. There was no evidence of social desirability among the Chinese participants (ratings of 4, 5, or 6).
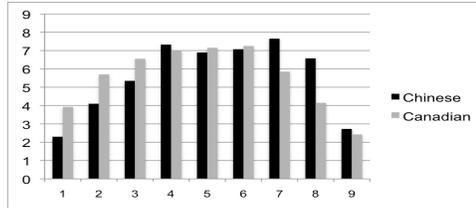
Figure 1. The frequency of ratings of 1-9 for each of the two cultural groups

3. Study 2

Studies of e-commerce websites have identified significant gender effects, both in within-cultures [22][23], and in between-culture studies [9]. To identify a similar effect in the present paradigm, gender was controlled; participants were Chinese (n=20) and Canadian (n = 20) living in Canada, and the stimuli included only Chinese e-commerce websites. Evidence in the cross-cultural literature suggests that East Asians 'see' more than North Americans in visual tasks [24]. Masuda and Nisbett [25], for example, showed that Japanese participants included information about the context of objects and about relationships among the objects 65% more often than Americans. Similarly, Masuda et al. [26] showed American and Japanese students cartoons depicting a happy, sad, angry, or neutral person surrounded by others expressing the same or a different emotion. They found that Japanese, but not Americans, were influenced by the surrounding people's emotions when judging the focal person's emotion.
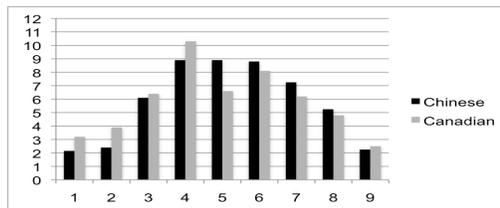

Figure 2. The frequency of ratings of 1-9 for each of the two cultural groups

There was no cultural congruency effect, but possible reasons for this as well as for the absence of a gender effect are discussed later. The frequency of ratings of 1 through 9 is shown in Figure 2. As in Study 1, Canadians gave slightly more ratings at the low end of the scale (ratings of 1, 2, and 3) than the Chinese participants, again suggesting an ERS bias. However, none of the independent-samples t-tests (ratings of 1, 2, 3) were significant. Chinese participants gave slightly more ratings of 5 and 6 than the Canadians, but the t-tests for ratings of 4, 5, and 6 revealed a difference only for ratings of 5, $t(38)=$

1.691, p < .05, thereby providing some evidence for a social desirability effect. The Chinese participants gave slightly more ratings of 7 and 8 as in Study 1, suggesting slight acquiescence, but the t-tests for ratings of 7, 8 or 9 were not significant.

4. Study 3

This study included 50 North American homepages and a sample of Canadian (n = 20) and Taiwanese participants (n = 16) all living in Taiwan. They spoke no English, and they had minimal exposure to Western culture. Higher ratings for Canadians would thus represent cultural congruency. There was a marginally significant effect of culture (p <.058). However, these were actually higher for the Taiwanese than for the Canadian participants. This finding can be said to represent a 'reversed' cultural congruency effect.

The frequency distribution of ratings is shown in Figure 3. Canadians again gave more ratings of 1, 2, and 3 than the Taiwanese participants; the t-tests differed for ratings of 2, t (30) = 1.76, $p < .05$ and 3, t (30) = 1.71, p < .05, again providing some evidence of an ERS bias. The Figure suggests a trend towards social desirability for the Taiwanese participants. However, the t-tests for ratings of 4, 5, and 6 differed only for ratings of 5, t (30) = 2.12, p < .05, thus again providing partial support for social desirability. Starting with ratings of 4, the Figure shows a trend towards Taiwanese acquiescence except for ratings of 9. The t-tests (ratings 7, 8, 9) were not significant.
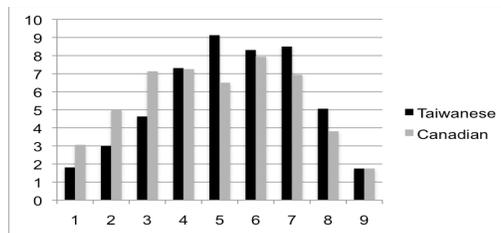

Figure 3. The frequency of ratings 1-9 for each of the two cultural participant-groups

5. General discussion, ongoing and future studies

A cultural congruency effect was found in Study 1 exposing Chinese and Taiwanese homepages representing a wide variety of websites. No such effect was found in Study 2, which used only Chinese B2C e-commerce sites. At first glance, this seems strange. However, an anecdotal comparison of ratings by culture and gender revealed an interesting pattern. Ratings for Chinese females were invariably somewhat higher than for Canadian females, but this was reversed for males where Canadian males invariably rated the homepages somewhat higher than Chinese

males. This would eliminate any potential effects of culture. Other studies have found consistent and significant gender differences both in male and female-produced websites, and in male and female preferences for websites designed by members of their own gender. Moss and her colleagues, for example, identified 23 variables related to visual appeal, navigation and use of language of which 13 were found to differ significantly between male- and female-produced websites (Moss & Gunn, 2009). Thus, females were more likely than males to use rounded than straight shapes, to use more colors, and to avoid a horizontal layout in their personal homepages. Participants were blind to the designer's gender, but preference data showed that both genders preferred websites designed by members of their own gender. Since the number of males in the IT industry by far exceeds the number of females, it is possible that this factor influenced our findings. We have no way of knowing the gender of designers producing the homepages used in our studies, but we are currently running a study in which both the designers' and the participants' gender is carefully controlled. Findings will be reported at INTERACT.

Table 1. Summary of rating scale biases

Study	Homepages	ERS	Soc. Desirability	Acquiescence
1	Taiwanese/Chinese	Trend low end	No	Yes, some
2	Chinese	Trend, low end	Yes, some	Trend only
3	North American	Yes, low end	Yes, some	Trend only

The reverse cultural congruency effect on North American homepages could represent a novelty effect among the Taiwanese participants who had almost no exposure to English-language websites. We are planning to investigate this possibility with a series of studies controlling more carefully for both gender and previous exposure to local websites in different cultures. As in Moss and her colleagues' studies, we will use samples of personal websites, as these reflect the way individuals wish to present themselves on the Web. That is, they are not bound by any corporate design restrictions, team-based decisions, or other constraints.

Concerning rating scale biases, Table 1 summarizes the trends in the above studies. Although the three studies provided some evidence in support for all three biases, these are neither robust nor systematic. One possible explanation is that, although the homepages represented the most and least visually appealing pages from larger samples, they may not have been sufficiently polarized to yield clearer results. Given the apparent importance of Web designers' gender, careful control for this should be more likely to yield a more clear-cut insight into potential rating scale biases. Rating scale biases reported in the literature are typically found in studies seeking degree of agreement with textual statements or judgments of latent variables such as the emotion of a focal person. The biases may not be as easily identified in studies

requiring quite different kinds of judgments, for example, of visual appeal. Still, with the growing interest in inter-cultural studies and the trend towards globalization of websites, it is important to pursue this possibility further. We therefore include analysis for such biases in our current and future studies. In conclusion, it appears that cultural congruency, rating scale biases, and gender differences do exist in the production and assessment of websites. All of these are taken into consideration and controlled for in our studies currently underway, to pinpoint exactly where these effects are greatest.

Acknowledgements

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