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EXPLORING HUMAN IMAGES IN WEBSITE DESIGN: A MULTI-METHOD APPROACH[1]

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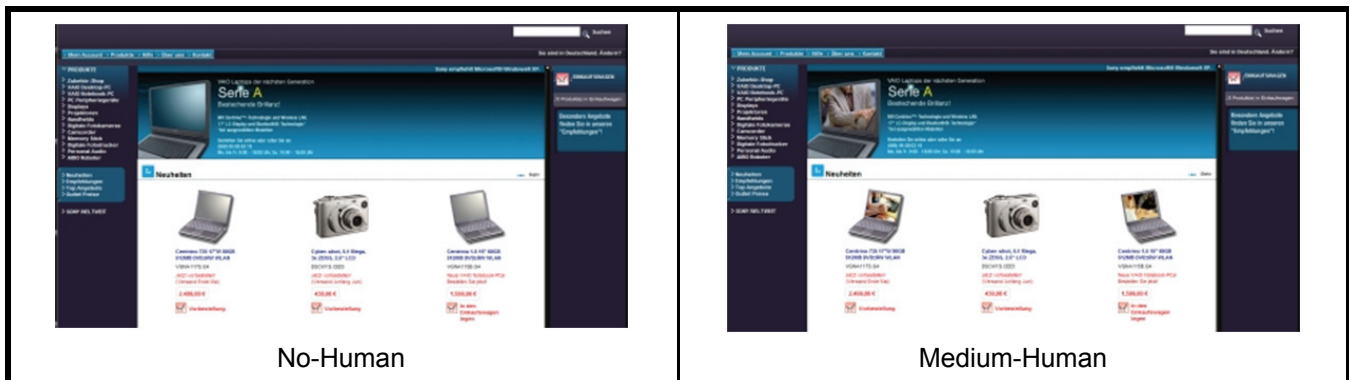U.S.A.
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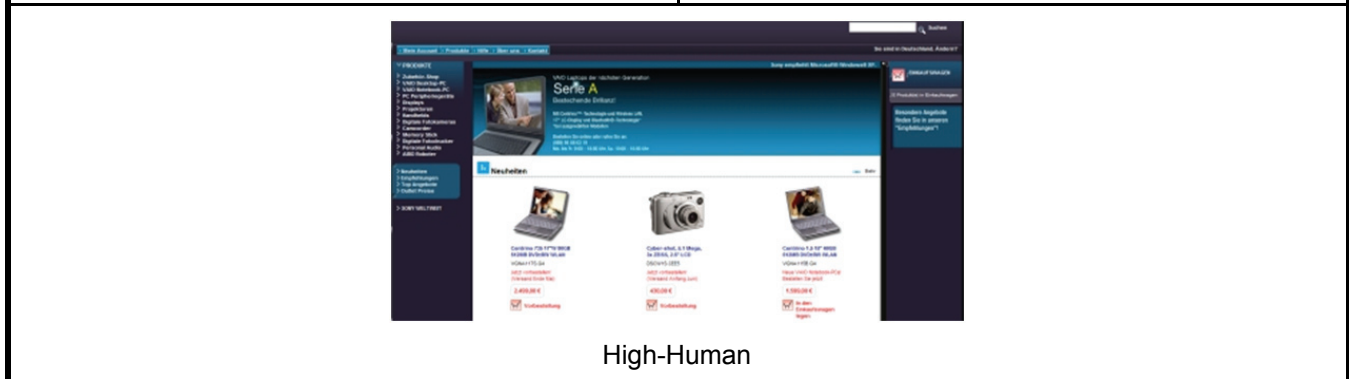
Appendix A

Experimental Websites

No-Human   Medium-Human

High-Human

Figure A1. Canada

No-Human

Medium-Human

High-Human

Figure A2. Germany

Figure A3. Japan

Appendix B

Using Multiple Methodologies

Various researchers advocate the use of multiple methodologies to gain deeper and more reliable perspectives on a topic (Boudreau et al. 2001; Kaplan and Duchon 1998; Palvia et al. 2003, 2004). Different data gathering methods also are required to determine the extent to which instrumentation may influence outcomes of the research (Straub et al., 2004). However, in a survey of IS literature, it was discovered that only 12 of 428 articles from 1996 to 2000 considered common methods bias resulting from the use of one method for data collection (Woszczynski and Whitman 2004). In a review of IS research on national and organizational culture only 3 studies out of 83 used a multi-method approach (Leidner and Kayworth 2006). We aim for greater robustness in the current investigation through the use of multiple methods.

Although questionnaires and interviews are often used in IS research, use of an eye tracking device in a laboratory setting is less common. However, analysis of eye movements has a long and varied history pioneered over 100 years ago for the study of reading. As early as 1935, eye fixations and scan paths were measured while individuals freely viewed artwork samples (Buswell 1935). An eye fixation is a relatively motionless gaze which lasts between 200 and 300 milliseconds, during which visual attention is aimed at a specific area of a visual display (Pan et al. 2004; Rayner 1998). Eye movements are typically an indication of the viewer's spatial focus of attention on a display (Goldberg and Kotval 1999). Eyes naturally fixate on areas that are surprising, salient, or important related to previous experience (Loftus and Mackworth 1978). However the exact *meaning* of eye movements and fixations is difficult to determine by gaze alone (Just and Carpenter 1984), and has variously been attributed to perceived importance, complexity, difficulty, or interest of a visual display (Pan et al. 2004; Rayner 1998). It is expected a triangulated multi-method approach as in the current study, which employs interview questions, a questionnaire, and eye tracking, will help to provide insights into the meaning of data obtained using the eye-tracker.

In a consumer context, previously cumbersome technology and artificial settings have severely limited contributions of eye tracking to theory and practice. However, eye-tracking research holds the promise of providing unprecedented insights into consumer behaviors and preferences (Pieters et al. 2002), and recent developments in technology and data collection methodologies have allowed more natural viewing conditions. In the current investigation, research participants sit at a computer with a noninvasive eye monitor attached to the head.

Most recently, and considering the proliferation of personal computers, an increasing number of researchers have focused on the use of eye movements to study human-computer interface issues (Boaz et al. 2002; Merwin 2001; Pan et al. 2004), and to evaluate preferences among websites (Tzanidou 2003). Little, if any, research has employed eye-tracking methodology to examine preferences for different levels of human images, especially across cultures.

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Appendix C

Questionnaire Items and Sources

Note: The questionnaire consisted of the following statements that were ranked on a five-point Likert scale from "strongly disagree" to "strongly agree."

Perceived Social Presence (Source: Gefen and Straub 2003)
SP-1: There is a sense of human contact in the website
SP-2: There is a sense of personalness in the website
SP-3: There is a sense of sociability in the website
SP-4: There is a sense of human warmth in the website
SP-5: There is a sense of human sensitivity in the website

Image Appeal (New Construct)
IA-1: The images used in the website appeal to me emotionally*
IA-2: The images used in the website are appropriate
IA-3: The images used in the website are satisfying
IA-4: I prefer images of people using the products*
IA-5: I prefer images of products only*
IA-6: The images used in the website are not distracting*
IA-7: The images used in the website are exciting
IA-8: The images used in the website are interesting
IA-9: The images used in the website make the products look appealing

Trust (Source: Gefen 2000; Yoon 2002)
T-1: I can trust this website
T-2: I trust the information presented on this website
T-3: I trust the transaction process on this website

*Dropped items due to low loadings and/or high cross-loadings

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Appendix D

Interview Questions

1. Are there any images that stand out in your mind?
2. How did these images make you feel?
3. Were there any images that made the site look friendly and warm?
4. Were there any images that made the site look unfriendly or cold?
5. Which type of images would you use, if any?
6. Are there any other impressions you would like to share?

Appendix E

Post Hoc Cultural Background and Analysis

Acceptance of website design features differs among cultures (Cyr and Trevor-Smith 2004; Evers and Day 1997; Nielsen and del Galdo 1996), including user reactions to images (Barber and Badre 1998; Nielsen and del Galdo 1996; Sun 2001). Communication styles differ across cultures and highly individualistic countries like Canada and the United States prefer more factual and text advertising, while collectivist countries like Japan prefer more symbolic messaging (de Mooij 1998; Hong et al. 1987). Differences have been found for website preferences, including screen design, for Canadians, Americans, Germans, and Japanese (Cyr et al. 2005). In particular, a preference for visuals is highlighted by Japanese respondents. In a study of website design across cultures, Cyr (2008) tested visual design (but not images specifically) to trust and satisfaction for Canadians, Germans, and Chinese. Visual design resulted in trust only for Chinese. In other work, content analysis of American and Chinese websites revealed significant differences in the use of symbols and pictures due to culture (Singh et al. 2003). Finally, when examining Web pages, users from collectivist cultures like Brazil or China prefer pictures and visuals while Germans are best satisfied with clear navigation links, hierarchical and structured page layout, and a more functional approach (Sun 2001).

The preceding work suggests that varied preferences exist related to website design in different countries. Although visual design has been systematically investigated (e.g., Cyr 2008), there appears to be no study in which the impact of different levels of human imagery is investigated across cultures. We explore this premise in a post hoc analysis with the following results.

In Table E1, the mean image appeal, perceived social presence, and trust scores for the three human image conditions are provided across the three countries (Canada, Germany, and Japan). The PLS model was run with culture moderating the relationships between human images and image appeal, perceived social presence, and trust. Culture was coded using two 0/1 dummy variables to categorically capture the three countries. Model results, including moderators, are shown in Table E2.

A partial least squares product indicator approach for measuring interaction is employed as suggested by Chin et al. (1996). In all cases, the interactions are not significant. Therefore, based on the sample in this research the overall influence of human images on image appeal, social presence, and trust is universal and not statistically moderated by culture. Additionally, the model presented in Figure 1 was run for each culture (n = 90 for each model). It is interesting to note that there were no shifts in the significant and nonsignificant causal paths between the culture models. For example, the link between human images and trust remained nonsignificant in all three culture models. The only notable difference was that the German sample had higher R^2 values for perceived social presence (.13) and trust (.36).

However, in further finer-grained analyses, some subtle country differences emerge as also predicted. Pair-wise comparisons were conducted for the three human image treatments across the three cultures. These pair-wise comparisons, shown in Table E3, reveal some differences in image appeal and perceived social presence across cultures.

For the no-human condition, there are significant differences between Canadian and German (p < .01) and between Canadian and Japanese (p < .01) perceptions of image appeal. However, there are no differences between Germans and Japanese (p = .996) for this condition. For the medium-human condition, there is a significant difference in image appeal between Canadians and Japanese (p < .05), but not between Canadians and Germans (p = .382) or Germans and Japanese (p = .431). Similarly, for the high-human condition, there are significant differences in image appeal between Canadians and Japanese (p < .010), but not between Canadians and Germans (p = .076) or Germans and Japanese (p = .446). Therefore it appears Canadians and Japanese are most different in their perceptions of image appeal across the three conditions, whereas Germans are more similar to the Japanese in their perceptions of image appeal.

Table E1. Average Image Appeal, Perceived Social Presence and Trust for the Three Human Conditions Across the Three Countries

Condition	Country	N	Image Appeal	Perceived Social Presence	Trust
No-Human	Canada	30	3.700	2.613	3.639
	Germany	30	3.033	1.820	3.534
	Japan	30	3.015	2.680	3.222
Medium-Human	Canada	30	3.640	3.127	3.467
	Germany	30	3.333	2.613	3.646
	Japan	30	3.047	2.640	3.156
High-Human	Canada	30	3.953	3.087	3.522
	Germany	30	3.540	2.987	3.744
	Japan	30	3.312	3.160	3.278

Table E2. PLS Model with Culture Moderators

Dependent Variable	Independent Variable	Path Coefficient	*t*-value	R^2
Image Appeal	Human Images (HI)	.213	2.155*	
	Culture	.342	2.154*	.115
	HI × Culture	.093	.805	
Perceived Social Presence	Human Images (HI)	.228	2.800*	
	Culture	.192	1.557	.077
	HI × Culture	.029	.215	
Trust	Human Images (HI)	.069	1.259	
	Culture	.095	.740	.230
	HI × Culture	.114	.819	

*p-value < 0.05

Table E3. Multiple Comparisons for Image Appeal, Perceived Social Presence and Trust Across Three Human Conditions and Three Countries

Condition	Country Paired Comparison	Image Appeal (Sig.)	Perceived Social Presence (Sig.)	Trust (Sig.)
No-Human	Japan vs. Germany	.996	**.002****	.296
	Japan vs. Canada	**.005****	.960	.116
	Germany vs. Canada	**.007****	**.005****	.868
Medium-Human	Japan vs. Germany	.431	.994	.341
	Japan vs. Canada	**.031***	.142	.073
	Germany vs. Canada	.382	.115	.697
High-Human	Japan vs. Germany	.446	.786	.067
	Japan vs. Canada	**.003****	.958	.467
	Germany vs. Canada	.076	.923	.531

Notes: Tukey Test was used for the multiple comparisons.
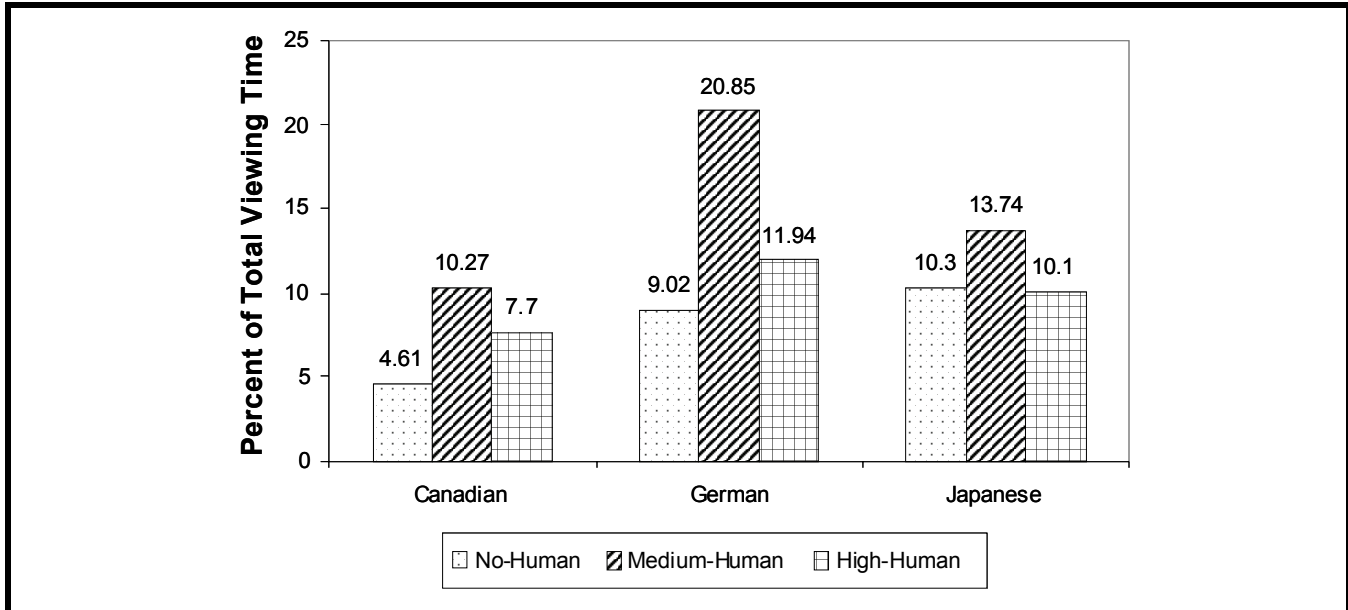*p-value < 0.05, **p-value < 0.01

Figure E1. Average Time Spent Viewing Manipulated Images Across Cultures
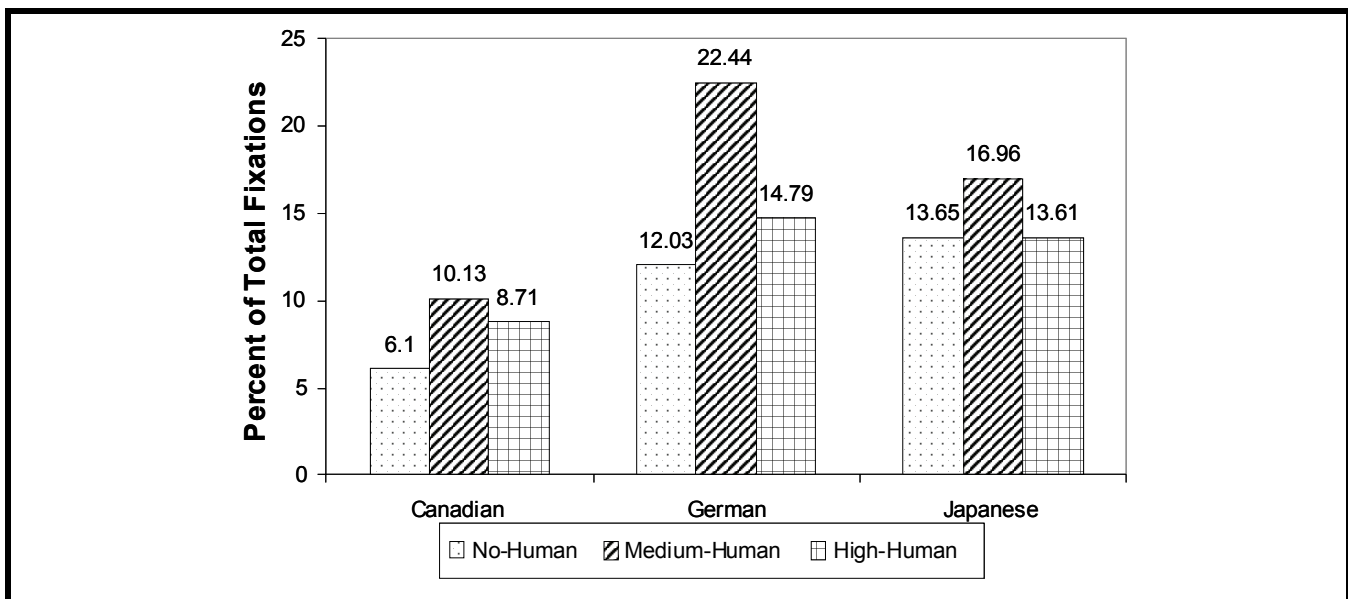

Figure E2. Average Number of Fixations on Manipulated Images Across Cultures

In terms of perceived social presence, significant differences between countries are only observed for the no-human condition. In this treatment, there are significant differences between Canadian and German ($p < .01$) and between German and Japanese ($p < .01$) perceptions of social presence. There are no differences between Canadian and Japanese perceptions for this treatment. Germans perceive a significantly lower level of social presence in the no-human condition.

Analyzing eye-tracking data for the three website conditions reveals a consistent pattern across cultures. Relative time and relative number of fixations spent viewing the manipulated images (compared to total time and total number of fixations) is displayed in Figures E1 and E2 respectively. As indicated when cultural samples were pooled, the medium-human condition draws the greatest visual attention from

participants in each of the three country samples. During interviews, Canadians and Germans are more detailed in their responses concerning the medium-condition images and as mentioned earlier found this condition to be unnatural and distracting.

Of interest, and based on the eye-tracking data, Canadians spend much less time (and have fewer fixations) on the manipulated images regardless of the human image condition. This difference is especially marked when compared to the German sample. In terms of the number of image fixations, Canadians demonstrate significantly lower levels than Germans for the no-human ($p < .05$), medium-human ($p < .01$), and high-human ($p < .05$) conditions.

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