Computers in Human Behavior 29 (2013) 1358–1367

Contents lists available at SciVerse ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Website design in an international context: The role of gender in masculine versus feminine oriented countries

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ARTICLE INFO

Article history:
Available online 5 March 2013

Keywords:
Website design
Website trust
Website satisfaction
Gender
Culture

ABSTRACT

Previous research confirms there are differences between men and women concerning website design preferences. A few researchers have further suggested website preferences based on gender (i.e. whether one is a man or a woman) differ in countries that are typically considered higher in masculinity versus higher in femininity. As such, this supposes fewer differences exist between men and women in more feminine societies, while more significant differences occur in more masculine societies. To test this assumption, we survey a total of 955 participants located in six countries. More particularly, we examine design constructs of Information Content, Navigation Design, Visual Design modeled to Website Trust and Website Satisfaction. We are interested to determine if gender differences are strong in higher masculinity countries and weak in lower masculinity countries. We also investigate if gender moderates the various relationships in our model. As predicted, in higher masculinity countries there are more differences between men and women, and gender is more likely to moderate the relationships in the model. This research has implications for the complexity of website design preferences, and extends earlier work on website design in a multiple country sample where masculinity–femininity differs. Theoretical contributions and design issues are elaborated.

1. Introduction

There are differences in perception of the Internet experience between men and women, and these differences transfer to the online shopping experience (Garbarino & Strahilevitz, 2004; Rodgers & Harris, 2003). More particularly, previous research outlines that men and women have different preferences concerning website design, and this applies in an e-business setting (Moss, Gunn, & Kubacki, 2008; Simon, 2001). Based on gender (i.e. whether one is a man or a woman), differences have been uncovered related to online social presence and enjoyment (Cyr, Hassanein, Head, & Ivanov, 2007), website design and satisfaction (Cyr & Bonanni, 2005; Moss, Gunn, & Heller, 2006), social norms (Szymanski & Hise, 2000), online risk (Garbarino & Strahilevitz, 2004), or website trust (Awad & Ragowsky, 2008; Riedl, Hubert, & Kenning, 2010; Sebastianelli et al., 2008). While some research has addressed gender differences and website design in an online shopping context, almost no research examines this topic across countries.

It is known that there are different design preferences in different cultures (Gefen, Geri, & Paravastu, 2007; Marcus & Gould, 2000), and these preferences have implications for website trust and website satisfaction (Cyr, 2008). Most often, researchers have used Hofstede's (1984) cultural dimensions to make predetermined cultural comparisons between countries (Vyncke & Brengman, 2010). One such dimension of interest in the current research is that of masculine–feminine cultures. Generally described, masculinity refers to societies which value competitiveness or independence, while femininity refers to societal values such as being gentle or compassionate (Hofstede, 1984; Srite & Karahanna, 2006). There is evidence to suggest that gender differences may moderate the technology acceptance model (TAM) in different cultures, and that this relationship may differ in more masculine versus more feminine cultures (Sanchez-Franco, 2006).

In a study based in Spain, Sanchez-Franco (2006) examined the impact of gender on Web acceptance and usage using an elaborated TAM in which flow and attitude were also considered. The findings revealed that as expected, women exceed men on a cluster of traits termed "socio-emotional, expressive and interpersonally oriented, whereas males exceed females on a cluster called task-oriented, instrumental and agentic" (Ibid, p. 22). However, not expected and counter to previous research, perceived ease of use influenced attitudes of males more so that for women. Sanchez-Franco suggests that the moderate masculinity ranking for Spain may have tempered the overall results of the study. More specifically, he proposed that "a high masculinity ranking indicates the country experiences a high degree of gender differentiation" (p.

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http://dx.doi.org/10.1016/j.chb.2013.01.050

33) since men in the country are more "masculine" in orientation than men in more feminine countries. This is an interesting, and untested supposition and has implications for the role of gender across cultures. It is this proposition that is at the core of the current research.

In the realm of website design, and based on the preceding, one would expect that preferences between men and women would be more different in higher masculinity countries than in more feminine countries. To test this premise, three elements of website design [Information Content, Navigation Design, and Visual Design] as used in previous research (Cyr, 2008; Cyr, Bonanni, Bowes, & Ilsever, 2005) are modeled to website trust and website satisfaction. The focus is not to test the model, but rather to determine if gender moderates these relationships, and further, if this is more the case in higher masculine countries than lower masculine (or more feminine countries). We also expect that there will be more significant differences between men and women for each of the constructs in higher masculinity countries. This results in the following research questions:

(1) Are there a larger number of significant differences between men and women in perception of website design elements (e.g. Information Content, Navigation Design, Visual Design) in countries that are higher in masculinity versus lower in masculinity?
(2) Are design elements (e.g. Information Content, Navigation Design, Visual Design) which lead to Website Trust and Website Satisfaction more likely to be moderated by gender in countries that are higher in masculinity versus lower in masculinity?

This research is aimed to contribute to an understanding of how gender perceptions of website design vary by country based on cultural variations. Further, does culture interact with gender to influence user perceptions? If this is the case, then as suggested by Sanchez-Franco (2006) research should focus not only on comparisons in the IT realm based on biological differences and whether one is a man or a woman, but also on the cultural values represented by country groups and how gender moderates website or other perceptions in a cultural context. In addition, this work has implications for website designers and how they might best tailor Web content for international users.

This paper begins with an overview of the theoretical background to the research including information processing differences between men and women, and cultural differences for masculinity–femininity related to country affiliation. This is followed by an explanation of the research model, and elaboration of the literature leading to our hypotheses. The method and results are presented, and the paper concludes with a discussion in which both theoretical and practical implications are outlined.

2. Theoretical background

2.1. Men, women and information processing

Men and women are known to process information differently and this spills into various areas of information technology communications (Gefen & Ridings, 2005; Gefen et al., 2007), including online shopping. Relevant to the current investigation in which comparisons between men and women are made with respect to website design, in other research concerning gender and website design both Simon (2001) and Sanchez-Franco (2006) refer to the Myers-Levy selectivity model as a theoretical framework for comparisons.

The selectivity model as first proposed by Myers-Levy (1989) asserts that women are comprehensive processors who are apt to assimilate all available information before arriving at a conclusion, while men are selective processors who rely on specific and readily available cues. Translated to an online shopping experience, women will spend considerably more time gathering information about products and comparing the merits of each prior to making the purchase decision. Men on the other hand, tend to pursue a minimizing approach whereby they make a selection as quickly as possible. This dichotomous approach is confirmed in a study of shopping in which men take a more goal-oriented approach and women seek a more interpersonal experience (Knowledge at Wharton, 2007). Simon (2001) more specifically suggests that given the comprehensive information processing strategy preferred by women, females using the Web may exhibit lower levels of favorable perception and satisfaction if websites fail to deliver gender relevant information.

Dittmar, Long, and Meek (2004, p. 440) wrote: "Men are more functional in their buying attitudes...whereas women stress social-experiential and identity-related concerns, and in particular, emotional involvement". Inadequately perceived emotional benefits may be an underlying reason why women are sometimes less involved in e-commerce activity (Cyr et al., 2007; Rodgers & Harris, 2003; Sanchez-Franco, 2006). The cited research suggests differences between men and women in technology use such as the Internet – including the experience of online shopping. There is a tendency for women to be less satisfied with online shopping than men (Cyr & Bonanni, 2005; Dittmar et al., 2004). Finally, the moderating effect of gender has been studied in a variety of IT settings, but has rarely been examined in an e-shopping setting (based on a table provided by Shen, Lee, Cheung, & Chen, 2010).

2.2. Cultural values of masculinity–femininity

While the previous discussion focused on differences in perception of websites based on biological differences and whether one is a man or a woman, an alternative perspective is how values manifested in different national cultures may also influence one's experience of the Web. Further, culture is known to effect perceptions of online shopping (Cyr, 2008; Cyr et al., 2005; Garrett, 2003; Srite & Karahanna, 2006).

Over the years, researchers have often used Hofstede's (1984) classifications to study social phenomena including website design and experience (Cyr et al., 2005; Gefen & Heart, 2006; Jarvenpaa, Tractinsky, Saarinen, & Vitale, 1999; Simon, 2001). Although there have been questions regarding the validity of using Hofstede's findings, results of his work have been supported quantitatively and qualitatively by numerous studies in various disciplines (Cyr, Head, Larios, & Pan, 2009; Sanchez-Franco, 2006; Straub, 1994). Of particular relevance to the current investigation, researchers who have studied website design used Hofstede's classifications for masculinity–femininity as a basis for comparisons (Marcus & Gould, 2000; Zahedi, Van Pelt, & Srite, 2006). As Zahedi et al. (2006) noted, masculinity–femininity is under researched and relates to Web communication richness and usability.

To elaborate, in masculine cultures values emphasize work goals such as material success and having challenging work. As defined by Hofstede (1984,1998) work goals include a focus on recognition, challenge, advancement, earning, and achievement defined by earnings. Alternately, in feminine cultures values are focused on quality of life, nurturing, and modesty (1984, 1998). Quality of life work goals emphasize a supportive and friendly work environment, cooperation, job security and achievement determined with respect to work relationships and human contacts.

Related to website design, Marcus and Gould (2000) compared websites from different cultures and found in higher masculinity cultures that interface design elements were focused on traditional gender/family/age distinctions; work tasks, roles, and mastery; navigation oriented to exploration and control; attention gained through games and competitions; and graphics, sound, and animation used for utilitarian purposes. Feminine cultures emphasize blurring of gender roles; mutual cooperation, exchange, and support rather than mastery and winning; and attention gained through poetry, visual aesthetics, and appeals to unifying values (Marcus & Gould, 2000). In other research focused on elements of website design leading to website trust and website satisfaction, more similarities occurred for Canada and China (both lower masculine cultures) compared to Germany (a higher masculine culture) (Cyr 2008). Of note, no gender comparisons were included in these studies.

As already noted, Sanchez-Franco (2006), predicted that in lower masculinity countries that there would be fewer differences in perception of websites since men and women would be more similar in terms of their socio-cultural values. According to this logic, it would also be expected that website design preferences would more likely be moderated by gender (i.e. whether one is a man or a woman) in countries that are higher in masculinity as opposed to lower in masculinity. This premise is central to some of the hypotheses tested in the current investigation.

3. Research model and hypotheses

This research is focused on whether there are differences in perception of website design between men and women in different countries, and whether or not gender moderates the perception of website design resulting in website trust and website satisfaction. In terms of website design, three design elements based on Garrett (2003) and used in other IS research are included: (1) Information Content – the extent to which information is complete, sufficient, and effective; (2) Navigation Design – the degree to which the navigational scheme or format helps or hinders users as they access different sections of a website; and (3) Visual Design – the degree to which design elements such as balance, uniformity, or aesthetics (e.g. colors, photos, fonts) enhance a website's overall look and feel. These design elements are modeled to website satisfaction and website trust – which are important outcome variables for e-shoppers and extensively used in prior IS research (e.g. Flavian, Guinaliu, & Gurrea, 2006; Jarvenpaa et al., 1999; Riedl et al., 2010; Szymanski & Hise, 2000). Refer to Fig. 1. Elements of the model are further elaborated in the following sections.

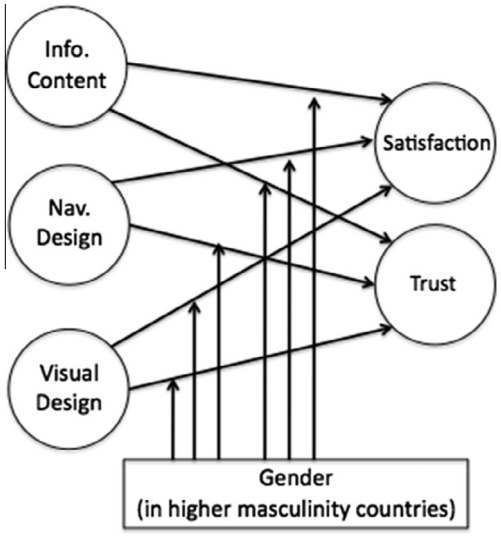

Fig. 1. Research model.

3.1. Website design, gender, and masculine–feminine cultures

Website design across countries (e.g. Barber & Badre, 1998; Cyr, 2008; Cyr et al. 2009; Gefen et al. 2007) has received attention in recent years. Alternately, only a few studies have explicitly explored differences regarding website design preferences between men and women (e.g. Cousaris, Swierenga, & Watrall, 2008; Cyr & Bonanni, 2005; Cyr et al., 2007; Moss et al., 2006; Moss et al., 2008; Simon, 2001). Moss et al. (2006) tested 30 male-produced and 30 female-produced websites and found significant differences between the two sets of websites on 13 of 23 factors with respect to navigation and visual content. Sites designed by women have links to a larger number of topics than those designed by men, use language differently, and manifest different elements of visual design such as using rounded versus straight shapes, more colors, a horizontal layout, and informal images.

In other work, Simon (2001) examined differences in website perceptions between men and women concerning information richness, communication effectiveness, and the communication interface and found women prefer websites with less clutter and fewer graphics than did men. In an e-service shopping environment, women experience higher levels of enjoyment related to the presence of social elements on the website than men (Cyr et al., 2007). Cyr and Bonanni (2005) uncovered differences on selected items between men and women for information design, navigation design and visual design. With the exception of Simon, these previous studies concerning differences between men and women with respect to website design were conducted in a single country only.

As previously outlined, men and women are expected to differ in their perceptions of website design and these differences will be magnified in more masculine over less masculine countries (e.g. Sanchez-Franco, 2006). Specific to the masculinity–femininity dimension, Zahedi et al. (2006) used an interpretive perspective to analyze Web documents aimed at predominantly men or women to identify beliefs, attitudes, rhetoric, and syntactic "signifiers" (using their term) based on masculinity–femininity. Differences were discovered in each category. As one example, a rhetoric signifier for masculinity would be a website with an emphasis on numerical facts, use of irony, and brief and assertive commentary; websites with more feminine rhetoric signifiers would be more feeling oriented, defer to expertise, and be more explanatory in nature.

While the research by Zahedi et al. (2006) examined masculinity–femininity as underlying societal values in North America, their work can be translated to a cross-country setting where country values are more masculine versus feminine. For instance, in the current research it would be expected that in countries that are more masculine there would be a greater discrepancy between rhetoric signifiers on websites than in more feminine countries, where both men and women would be more feeling oriented. The same argument could apply in that there will be greater differences in the perception of other website elements between men and women in countries that are more masculine in orientation. With respect to masculine versus feminine countries, we offer the following hypothesis:

H1. Between men and women there will be a larger number of significant differences in perception of design elements (for information content, navigation design, and visual design) in countries that are higher in masculinity versus lower in masculinity.

3.2. Website trust related to gender in masculine–feminine cultures

Website design elements have the potential to influence website trust (Casalo, Flavian, & Guinaliu, 2007; Cyr, 2008; Flavian et al., 2006; Yoon, 2002). According to Jarvenpaa et al. (1999) online trust refers to consumer confidence in the website and a "*willingness to rely on the seller and take actions in circumstances where such action makes the consumer vulnerable to the seller*" (p. 4). Building on this definition, in the current research online trust refers to general trust of the website, and that the user can trust the transaction process as well as information presented.

Women have generally been considered less comfortable with the use of technology than men (Adam, Emms, Green, & Owen, 1994; Garbarino & Strahilevitz, 2004), and overall women are less likely to trust a website than men (Rodgers & Harris, 2003). With reference to gender and trust in online shopping environments, women perceive a higher level of risk in online purchasing than men, and are less trusting of Web shopping (Garbarino & Strahilevitz, 2004). In a study in which perceived quality of online retailers was examined women place significantly more importance on privacy and security than do men, and the authors note these dimensions are closely related to trust (Sebastianelli, Tamimi, & Rajan, 2008). Cyr and Bonanni (2005) discovered significant differences concerning the degree men and women trust information as presented on a website – with women less likely to trust. These single country findings will now be tested in an international sample including six countries.

There is a connection between trust and culture, and the way in which trust is created depends on culture (Gefen & Heart, 2006). Although research into trust and e-commerce across cultures is rare, previous studies have considered individualism–collectivism (Jarvenpaa et al. 1999) or uncertainty avoidance (Vance, Elie-Dit-Cosaque, & Straub, 2008). To our knowledge, in the only investigation in which masculinity and femininity were modeled to TAM including trust, both masculinity and femininity had an effect on trust (Cyr et al., 2009). Hence, based on: (1) men and women differ in their ability to trust website elements; (2) masculinity and femininity are related to trust; and (3) previous literature suggests that between men and women there may be more differences related to design elements in countries higher in masculinity versus lower in masculinity (as in H1); we pose the following hypotheses.

H2. Between men and women there will be a larger number of significant differences in perception of trust in countries that are higher in masculinity versus lower in masculinity.

H3. Design elements (for information content, navigation design, and visual design) leading to website trust will more likely be moderated by gender in countries that are higher in masculinity versus lower in masculinity.

3.3. Website satisfaction and gender in masculine–feminine cultures

An effectively designed website may engage and attract online consumers resulting in satisfaction with an online vendor (Agarwal & Venkatesh, 2002; Koufaris, 2002; Szymanski & Hise, 2000). Palmer (2001) validated design metrics for websites and found information content, site organization, and navigation are important to website success, including intent to return to the site. In other research, website design and the "*ambience associated with the site itself and how it functions*" is related to online satisfaction (Szymanski & Hise, 2000, p. 313). In the current investigation, website satisfaction refers to overall contentment with the online experience (Anderson & Srinivasan, 2003; Flavian et al., 2006), and may include access to information, a positive navigation experience, and perception of a well-designed website (Barber & Badre, 1998).

While a few studies have examined online satisfaction and gender, there is evidence that women tend to be less satisfied with the online experience than men (Dittmar et al., 2004). Further, men and women differ in their 'web acceptance and usage processes' (p. 19) – with men more driven by instrumental factors with stronger perceptions of usefulness of the Web than women (Sanchez-Franco, 2006). Based on an investigation in which usefulness of a website was examined in relationship to flow (defined as the holistic sensation people feel when acting with total involvement), this relationship was stronger for males than for women (Sanchez-Franco, 2006). In a study in which information design, navigation design, and visual design were examined, statistically significant differences were found between men and women regarding website satisfaction (Cyr & Bonanni, 2005). In particular, men found the website more visually appealing and better able to fulfill personal needs and expectations. Following parallel logic as in the preceding section on trust, we pose similar hypotheses for satisfaction.

H4. Between men and women there will be a larger number of significant differences in perception of satisfaction in countries that are higher in masculinity versus lower in masculinity.

H5. Design elements (for information content, navigation design, and visual design) leading to website satisfaction will more likely be moderated by gender in countries that are higher in masculinity versus lower in masculinity.

4. Research method

4.1. Participants

A total of 955 participants located in Canada (309), the United States (196), Germany (120), Mexico (71), Chile (48), and China (211) completed an experimental task and online survey. These countries were selected as they represent diversity according to Hofstede's (1984) cultural dimensions, represent different geographic locations, and differ in socio-economic development.

For the purpose of the current research, countries are grouped according to whether they are higher in masculinity (Mexico – 69; Germany – 66; the United States – 62) or lower in masculinity (Chile – 28; China – 50; Canada – 52). The mean masculinity–femininity score for the higher group is 65.66 and for the lower group it is 43.33.

To ensure participants are "of the culture" it was determined each had lived in the country the majority of their life and spoke the native language as their primary language. Participants were recruited from a wide range of sources including universities, institutes, and companies. Average age across countries is similar with an overall average of 27 years. Participants are experienced online shoppers and well educated. Most had completed either a university degree or post-graduate education. An overview of participants for each country appears in Table 1. To determine if significant differences existed across cultures based on demographics, ANOVA tests were run for age, education, online shopping experience and SonyStyle (the website used for this study) experience and brand impression. Overall, no differences occurred between cultures that would influence the constructs tested in this research.

Table 1
Participant demographics.

Demographic	Canada $n = 309$	USA $n = 196$	Germany $n = 120$	Mexico $n = 71$	Chile $n = 48$	China $n = 211$	Total $n = 955$
Mean age	27.7	29.1	26.3	23.9	29.6	24.8	27.0
Gender	M: 148	M: 80	M: 60	M: 30	M: 11	M: 103	M: 432
	F: 161	F: 116	F: 60	F: 41	F: 37	F: 108	F: 523
Mean number of years shopping online	3.1	5.6	4.8	2.4	3.6	1.2	3.4
Education level*	HS: 121	HS: 86	HS: 2	HS: 5	HS: 10	HS: 25	HS: 249
	U: 129	U: 64	U: 94	U: 51	U: 24	U: 96	U: 458
	G: 45	G: 39	G: 21	G: 15	G: 11	G: 79	G: 210
	T: 14	T:7	T: 3	T: 0	T: 3	T: 11	T: 38
Has previously shopped at Sony website	Yes: 16	Yes: 26	Yes: 3	Yes: 2	Yes: 0	Yes: 29	Yes: 71
	No: 293	No: 170	No: 117	No: 69	No: 48	No: 182	No: 884
Impression of Sony brand (7 point scale: 1 = very low; 7 = very high)	5.0	6.2	2.8	2.2	2.3	3.1	4.2

HS = High School; U = Undergraduate; G = Graduate; T = Technical.

4.2. Task and website design

This research targets user impressions of B2C Web pages. For the research treatment participants responded to the localized version of the SonyStyle website represented in their native language. The SonyStyle website was chosen after an extensive search for a well localized vendor website in which the design of the website was adapted to be appropriate to the culture of each user as determined by a design expert who rated each country website. To recruit participants, the researcher sent an email to international colleagues with a link where instructions for the research and an online survey were found. These colleagues further distributed the email to students and members of their respective organizations. Participants were requested to initially view the home page of the local website, followed by navigation of the website to choose a cell phone they would hypothetically purchase. This methodology is consistent with Cyr et al. (2005) and Cyr (2008). Once participants concluded this task each completed an online questionnaire. Background information to the study, and all other written content including the questionnaire were translated and back-translated into each required language. As an incentive to participate in the study, participants could optionally enter their name in a draw for a US$ 250 gift certificate for Amazon.com.

4.3. Instrument validation

Content validity ensures construct items are representative and drawn from a universal pool (Cronbach 1971). The constructs used in the investigation are based on previous research and have been previously validated from a variety of sources and exhibit content validity. Questionnaire items and sources appear in Appendix A. All items were assessed on a 7-point Likert scale from strongly disagree to strongly agree. The questionnaire was pre-tested with 62 undergraduate students. Categories were evaluated for item validity and reliability and some items were slightly modified to improve readability and understanding.

Construct validity is demonstrated when there are relatively high correlations between measures of the same construct (convergent validity) and low correlations between measures of constructs that are expected to be different (discriminant validity) (Straub 1989). Table 2 shows the results of the confirmatory factor analysis (CFA) that was used to assess the psychometric properties of the multi-item scales, as outlined by Gefen and Straub (2005) for the full sample of participants. When using the CFA method to examine discriminant validity, Gefen and Straub (2005) recommend that the measurement items on their assigned latent variables should be an order of magnitude larger than their loadings on other variables. As evident from Table 2 this criterion is satisfied.

Table 2
CFA loading matrix and construct validity criteria.

	InfoCont	NavDes	VisDes	Trust	Sat
InfoCont1	**.816**	.438	.436	.467	.494
InfoCont2	**.827**	.418	.440	.400	.475
InfoCont3	**.840**	.508	.519	.499	.550
InfoCont4	**.818**	.425	.465	.380	.492
NavDes1	.459	**.863**	.512	.405	.490
NavDes2	.480	**.904**	.515	.469	.548
NavDes3	.485	**.851**	.548	.472	.544
VisDes1	.410	.406	**.703**	.420	.492
VisDes2	.493	.478	**.724**	.403	.584
VisDes3	.425	.498	**.734**	.485	.538
VisDes4	.358	.423	**.747**	.425	.564
VisDes5	.336	.350	**.679**	.355	.530
Trust1	.465	.488	.543	**.890**	.522
Trust2	.472	.448	.491	**.868**	.509
Trust3	.459	.413	.489	**.861**	.529
Sat1	.324	.374	.592	.357	**.707**
Sat2	.534	.506	.617	.518	**.846**
Sat3	.555	.494	.593	.459	**.838**
Sat4	.510	.539	.601	.547	**.778**
α-value	.844	.843	.765	.803	.844
Comp. rel.	.895	.905	.841	.872	.906
AVE	.681	.762	.515	.631	.762

InfoCont = Information Content; NavDes = Navigation Design; VisDes = Visual Design; Sat = Satisfaction.

Table 2 also summarizes various validity criteria for reflective constructs. Internal consistency is assessed by Cronbach α-values and composite reliability. Cronbach α-values ranged from .765 for Visual Design to .844 for Information Content, which exceeds the thresholds recommended by Nunnally (1978) and Rivard and Huff (1988). Similarly, the composite reliability of each construct exceeded the recommended threshold of .7 (Straub, Boudreau, & Gefen, 2004). Convergent validity is demonstrated as the average variance extracted (AVE) of all constructs exceeded .5, as per Fornell and Larcker (1981). Given the above analysis, the scales used in this investigation showed sufficient evidence of internal consistency, and convergent and discriminant validity.

5. Results

Comparisons were conducted using multivariate analysis using ANOVA ($n = 955$), with results shown in Table 3. Within country comparisons between men and women revealed seven significant differences for Information Content (Germany, US and Chile),

Table 3
Gender differences for higher masculinity countries (Germany, United States, Mexico) and lower masculinity countries (Canada, China, Chile).

Country	Construct				
	Info Cont *F*-Value (Sig)	Nav Design *F*-Value (Sig)	Vis Design *F*-Value (Sig)	Trust *F*-Value (Sig)	Satisfaction *F*-Value (Sig)
Higher Masculinity					
Germany (n = 120)	*12.41 (.001***)*	*4.053 (.046*)*	.482 (.489)	*4.297 (.040*)*	.077 (.782)
US (n = 196)	*4.759 (.030*)*	*4.471 (.036*)*	1.454 (.229)	1.440 (.232)	*4.603 (.033*)*
Mexico (n = 71)	2.319 (.132)	.678 (.413)	.036 (.851)	.861 (.357)	.276 (.601)
Lower Masculinity					
Canada (n = 309)	.000 (.995)	.364 (.547)	.025 (.874)	.434 (.511)	.241 (.624)
China (n = 211)	.346 (.557)	.469 (.494)	.836 (.361)	.121 (.729)	.049 (.825)
Chile (n = 48)	*5.170 (.028*)*	.011 (.916)	.039 (.844)	.762 (.387)	.641 (.427)

Note: For the higher masculine countries when significant differences occur, men score higher than women. For Chile, women scored higher than men for information content.
**$p < .01$.
* $p < .05$.
*** $p < .001$.

Navigation Design (Germany and US), Trust (Germany), and Satisfaction (US). From these seven significant differences, six occurred for the higher masculinity countries. It is interesting to note that for the higher masculinity countries when significant differences occurred, men always scored higher than women. For the one significant difference in the less masculine country (Chile), women scored higher than men.

To further explore if the significant differences as shown in Table 3 are attributed to gender effects, the eta-squared was calculated for each significant cell. Eta-squared is the proportion of the total variance that is attributed to an effect, also known as 'effect size' for use in ANOVA. It is analogous to R^2 in multiple linear regression (Dattalo, 2008). For Germany, the eta-squared for Information Content, Navigation Design and Trust were 0.095, 0.033 and 0.035 respectively. For the US, the eta-squared for Information Content, Navigation Design and Satisfaction were 0.024, 0.023 and 0.023 respectively. For Chile, the eta-squared for Information Content was 0.101. According to Cohen (1988), an eta-squared of 0.01 is considered small; 0.06 is considered medium; and 0.14 is considered large. Thus, five out of the seven significant cells in Table 3 have a small effect size and two have a medium effect size. However, effect sizes seen in the social sciences are often very small and their results should not be discounted (Rosnow & Rosenthal, 2003). Meeting the minimum threshold of 0.01 effect size provides a positive indication that the significant cells in Table 3 may be attributed to gender effect.

As indicated in Section 4.1 above, ANOVA tests across countries revealed that demographic/control variables (age, education, online shopping experience, online shopping experience with the SonyStyle site and Sony brand impression) revealed that no differences occurred that would influence the constructs of this research. However, it is worth exploring if these variables may impact the significant gender results within countries as shown in Table 3. In other words, could some other variables be influencing the significant differential results in Table 3, other than gender? To conduct this within country analysis, regression was used where all demographic/control variables were added as dependent variables, in addition to gender. This analysis was conducted for the seven significant cells of Table 3 and is presented in Table 4.

As shown in Table 4, with the addition of all our control constructs, gender remains a significant difference for all significant cells in Table 3 except for Navigation Design in Germany and Information Content in Chile. Sony brand impression appears to have a significant impact on many of our variables across countries. This is consistent with prior marketing research (for example, see a review by Raggio & Leone, 2009). Despite the strong influence of brand (as well as some other control variables), significant gender differences still occur for Information Content and Trust in the German sample and for Information Content, Navigation Design and Satisfaction in the US sample. Both Germany and the US are classified as higher masculinity countries.

A goal of this investigation is to determine if differences between men and women for perceptions of design elements are higher in higher masculinity countries than in lower masculinity countries. Re-examining Tables 3 and 4, where results are shown individually by country, all of the significant findings for design elements were in higher masculinity countries – providing support for H1. For both Germany and the US, men had significantly higher perceptions of information content compared to women. In the US, men also had significantly higher perceptions of navigation design. In addition, when trust or satisfaction is significantly different for men and women, this occurred in higher masculinity countries – providing some support for H2 and H4. Thus, based on the individual country analysis, it is reasonable to conclude that between men and women there are more significant differences in perceptions of design elements as well as trust and satisfaction in countries that are higher in masculinity versus lower in masculinity.

Another goal of this investigation is to determine if the relationships between the design elements and trust and satisfaction are more likely to be moderated by gender in countries that are higher in masculinity versus lower in masculinity (H3 and H5). A structural equation modeling (SEM) approach is adopted to examine these two gender moderation hypotheses. The variance-based PLS method was chosen over covariance-based methods, such as LISREL, as it is relatively robust to deviations from a multivariate distribution (Gage, 1999) and supports exploratory and confirmatory research (Gage, 1999). Since PLS does not generate an overall goodness-of-fit index (as with LISREL), model validity is primarily assessed by examining structural paths and R^2 values (Churchill, 1979). As recommended by Chin (1998), bootstrapping (with 500 sub-samples) was performed to test the statistical significance of each path coefficient using t-tests.

To examine H3, separate PLS analyses were conducted for higher and lower masculinity samples (n = 387 and n = 568 respectively), where design elements were the exogenous variables and trust was the endogenous variable. The results are shown in Fig. 2, where the path coefficients and their t-values for the higher masculinity (HM) sample are shown above the arrow relationship and the path coefficients and their t-values for the lower masculinity (LM) sample are shown below the arrow relationship. All relationships between design elements (Information Content,

Table 4
Regression analysis of significant cells of Table 3 considering all control variables.

Country	Independent variable	R^2	Dependent variable	Beta	Sig
Germany	Information content	0.154	Gender	−0.214	.035*
			Age	−0.024	.803
			Education	0.013	.881
			Years Shopping Online	−0.059	.582
			Previous SonyStyle Shopping	0.050	.574
			Sony Brand Impression	−0.251	.007**
	Navigation Design	0.085	Gender	−0.122	.245
			Age	−0.101	.315
			Education	−0.088	.342
			Years Shopping Online	0.026	.813
			Previous SonyStyle Shopping	0.157	.091
			Sony Brand Impression	−0.157	.104
	Trust	0.175	Gender	−0.208	.038*
			Age	−0.003	.803
			Education	−0.045	.881
			Years Shopping Online	0.231	.582
			Previous SonyStyle Shopping	0.000	.574
			Sony Brand Impression	−0.331	.007**
United States	Information Content	0.103	Gender	−0.142	.046*
			Age	−0.023	.789
			Education	−0.079	.322
			Years Shopping Online	−0.060	.441
			Previous SonyStyle Shopping	−0.079	.266
			Sony Brand Impression	−0.241	.001**
	Navigation Design	0.136	Gender	−0.143	.040*
			Age	0.002	.982
			Education	−0.210	.008**
			Years Shopping Online	−0.040	.605
			Previous SonyStyle Shopping	−0.032	.646
			Sony Brand Impression	0.251	.000***
	Satisfaction	0.178	Gender	−0.152	.026*
			Age	−0.073	.370
			Education	−0.214	.005**
			Years Shopping Online	−0.075	.320
			Previous SonyStyle Shopping	−0.160	.019*
			Sony Brand Impression	0.241	.000***
Chile	Information Content	0.143	Gender	0.256	.090
			Age	−0.071	.679
			Education	0.295	.085
			Years Shopping Online	−0.046	.767
			Previous SonyStyle Shopping	−0.044	.782
			Sony Brand Impression	−0.139	.354

Navigation Design, Visual Design) and Trust are significant for both higher and lower masculinity samples. Approximately 42% of the variance in the Trust construct was accounted for by the design constructs for both higher and lower masculinity samples. The moderating effect of gender was examined on all relationships for both samples. The only case where gender was a significant moderator was on the relationship between Navigation Design and Trust for the higher masculinity sample – providing some support for H3.

Similarly, to examine H5, separate PLS analyses were conducted for higher and lower masculinity samples ($n = 387$ and $n = 568$ respectively), where design elements were the exogenous variables and satisfaction was the endogenous variable. The results are presented in Fig. 3, which shows that all relationships between design elements (Information Content, Navigation Design, Visual Design) and Satisfaction are significant for both higher and lower masculinity samples. Approximately 66% and 63% of the variance in the satisfaction construct was accounted for by the design constructs for higher and lower masculine samples, respectively. The only case where gender was a significant moderator was on the relationship between Information Content and Satisfaction for the higher masculinity sample – thus providing some support for H5.

While only two relationships were significantly moderated by gender in Figs. 2 and 3, both were for the higher masculinity sample. Thus, it is reasonable to conclude that the relationships between the design elements and Trust and Satisfaction are more likely to be moderated by gender in countries that are higher in masculinity versus lower in masculinity.

6. Discussion and conclusion

6.1. Theoretical contributions

Research is limited regarding website perceptions between men and women, although there is some previous evidence that men and women have different preferences for website design and experience the Web differently in terms of website trust and satisfaction. This study, based on a large sample of participants from six country locations provides select evidence that this may be the case – based on an examination of specific design elements. To our knowledge, this is the first study in which gender differences are examined with an international sample that represents countries both high and low in masculinity. Typically, gender research is based on a single country sample. Differences occur between men and women concerning perceptions of website design related to Information Content, Navigation Design, Trust, and Satisfaction. Noteworthy, and based on the main focus of this investigation, six of the seven significant differences between men and women occurred in higher masculinity countries.

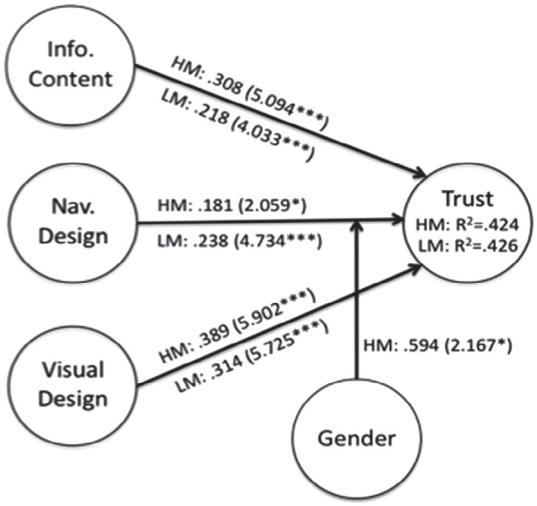

Fig. 2. PLS analysis of higher and lower masculinity samples with trust as the endogenous variable. *Notes*: HM = Higher Masculinity sample (n = 387); LM = Lower Masculinity sample (n = 568); *indicated significance at a 0.05 level; ***indicated significance at a .001 level; only significant gender moderations are shown.

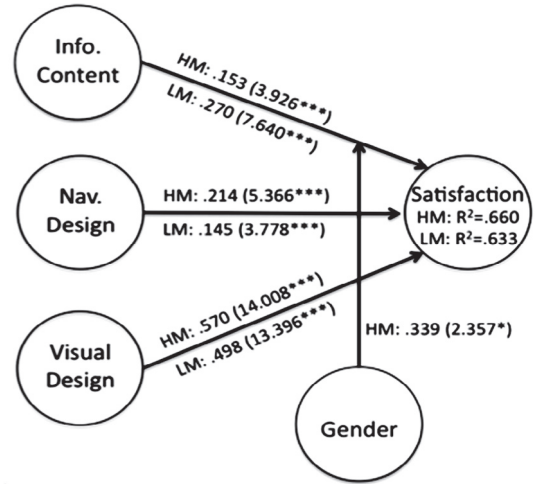

Fig. 3. PLS analysis of higher and lower masculinity samples with satisfaction as the endogenous variable. *Notes*: HM = Higher Masculinity sample (n = 387); LM = Lower Masculinity sample (n = 568); *indicated significance at a 0.05 level; ***indicated significance at a .001 level; only significant gender moderations are shown.

The direction of the findings was as expected based on previous research for website design (Cyr & Bonanni, 2005; Simon, 2001), trust and risk (Cyr & Bonanni, 2005; Garbarino & Strahilevitz, 2004), and satisfaction (Dittmar et al., 2004; Simon, 2001). In all cases when there are significant differences between men and women, the women scored lower than the men when considering the potential impacts of several control variables (including brand perceptions). Overall, the diverse findings between men and women imply that different forms of information processing (Knowledge at Wharton, 2007; Myers-Levy, 1989; Sanchez-Franco, 2006) may occur between men and women, in particular in higher masculinity countries. In the introductory portion of this paper information processing strategies were advanced in which men are selective information processors and women more comprehensive when processing information. It could be that in higher masculine countries website content is created that generally supports the information needs of men more than women.

Related to masculinity and femininity, a goal of this investigation was to determine if gender has a moderating effect on the relationship of design elements to trust and satisfaction in higher masculinity countries more than in lower masculinity countries. When a moderating effect is found, this occurs in higher masculine countries (for Navigation Design to Trust and Information Content to Satisfaction) with a more significant moderation effect for males in each case. No moderating effects for gender occurred in lower masculinity countries. These findings support the earlier supposition by Sanchez-Franco (2006) that in countries with lower masculinity rankings there will be less differentiation of values and hence perceptions of website design between men and women. While this idea is new in the literature it offers interesting potential for how to interpret user reactions to website design based on sociocultural values.

The current research thus represents a unique contribution to examine not only gender, but also other factors that moderate perceptions of website design that to date are unexplored. In short, gender differences are strong in high-masculinity countries, and weak in low masculinity countries. More generally, this research addresses the interplay between culture and gender differences as they apply in online shopping. As suggested by Sanchez-Franco (2006), research should go beyond a sole focus on comparisons based on biological differences and whether one is a man or a woman, to also consider cultural values as represented by country groups and how gender moderates website perceptions in a cultural context. The results of the current investigation provide preliminary support that differences occur in website perceptions between men and women, and the degree to which these differences occur depends on whether countries are masculine or feminine in orientation. This trend is an impetus to future investigations in this area.

6.2. Practical contributions

Zahedi et al. (2006) found differences concerning masculinity–femininity in Web documents aimed at male or female users. This work can be extrapolated to the current work now positioned in the context of different countries. For websites with a more masculine value orientation, design elements tend to focus more on performance, competition, leadership or self-success rather than on more feminine values of charity, compromise or concern for quality of life. Masculine-oriented websites generally emphasize more factual information. Translated to the constructs examined in the current research, this would suggest that Information Content specifically appeals to users in countries that are higher in masculinity versus lower in masculinity. Information would differ in tone and value orientation, and perhaps be positioned differently on the Web page. Further, for feminine-oriented websites Zahedi et al. (2006) found more examples of emotion than on masculine-oriented websites. This finding is consistent with other work in which hedonics and social presence are more important for women than for men (Cyr et al., 2007), and could also suggest that for maximum information processing in lower masculinity countries then elements of emotion or social presence should be included. Taken together, it appears design characteristics that embody masculinity or femininity have the potential to satisfy users within countries as well as between countries, and as such deserve additional consideration by both designers and researchers.

In line with the work by Moss et al. (2008), there is relevance to align user preferences with the design of websites to create empathy. This has application in two ways. First, relevant to the current research and consistent with Moss and her colleagues, there is merit in the design of female-oriented websites by women. Alternately predominantly male-oriented websites might be best designed by men. In the current design world, most websites are

designed by men regardless of the target audience (Moss et al. 2008). Expanding this to an international arena, in some instances multinational companies that market to a variety of countries have a team of designers (who are often North American based) design web content for international users. Based on some differences observed in the current investigation between higher and lower masculinity countries, one possibility is for designers to be aligned and empathetic on the masculinity–femininity dimension. In this case, a designer who is embedded in a feminine culture, for example, would design websites for countries that are also feminine-focused.

Clues for how to best develop websites for men and women can be gleaned from previous work. As one example, Moss et al. (2006) found that for female-produced websites there was a tendency to use informal language more than on male-oriented websites. Further, Moss et al. (2006) determined that sites designed by women have links to a larger number of topics than those designed by men, and also used different types of shapes, colors and images. This should signal to designers to pay attention to these design features if trust and satisfaction are to be induced in both men and women users – especially in countries where socio-cultural values are more differentiated.

6.3. Limitations of the research

Data was collected in six countries with a total of 955 participants. A large and diverse sample population is a positive feature of this investigation, although it should be noted that there is some variability in the sample sizes by country. Participants are from a variety of sources including companies, universities, and institutes which offers generalizability of the findings. Comparisons were made between two groups of countries that are higher in masculinity and lower in masculinity representing a mean spread of approximately a 20 point averaged spread between the two groups. While some interesting differences were obtained based on these comparisons, additional research in this area will ideally include countries that represent greater extremes in masculinity–femininity.

A single vendor website (SonyStyle) was used. The possibility of response biasing could occur as respondents are aware of the company name and reputation, and may have previously established impressions of the company. In addition, a single task was used of searching for a cell phone for hypothetical purchase on a product-based website. No actual purchase was required. While this procedure is consistent with other e-commerce research, this may limit transferability of the findings to real e-commerce situations. In the future, similar research could be expanded to include a greater variety of tasks on both service and product websites, a larger sample of websites, or websites without specific branding.

6.4. Summary and conclusion

Since the investigation of website preferences and the online shopping experiences between men and women across cultures is relatively new, there is much scope for future studies in this field. Further research is suggested to more deeply probe online trust or satisfaction. For instance, Riedl et al. (2010) examined neural gender differences in online trust using functional magnetic resonance imaging (fMRI) to capture brain activity. As already noted, some differences in design preferences for men and women indicate this area offers opportunities to expand understanding as to what is gender relevant when browsing or shopping online. Particular to the current research, additional investigation can focus on implications of masculine-oriented and feminine-oriented website design as it pertains to different countries. Given the subtlety of research in these areas, use of qualitative methodologies may be useful to more fully examine various user perceptions of website design.

Appendix A. Survey Items and sources

Note: The survey consisted of the following statements that were rated on a 7-point Likert scale from 'very strongly disagree' to 'very strongly agree'.

Information Content (Source: Cyr 2008)
InfCont-1. The information provided at this site is complete
InfCont-2. The information provided at this site is sufficient
InfoCont-3. The information provided at this site is effective
InfoCont-4. The website adequately meets my information needs

Navigation Design (Source: Cyr 2008; Cyr et al. 2005)
NavDes-1. I can easily navigate this site
NavDes-2. I find this website easy to use
NavDes-3. This site provides good navigation facilities to information content

Visual Design (Source: Cyr 2008; Cyr et al. 2005)
VisDes-1. The degree of interaction (video, demos selected by the user) offered by this site is sufficient
VisDes-2. This site allowed me to efficiently tailor the information for my specific needs
VisDes-3. This website looks professionally designed
VisDes-4. The screen design (i.e. colors, images, layout, etc.) is attractive
VisDes-5. The website animations are meaningful

Website Trust (Source: Cyr 2008; Cyr et al. 2005; Cyr et al. 2007)
Trust-1. I can trust this website
Trust-2. I trust the information presented on this website
Trust-3. I trust the transaction process on this website

Website Satisfaction (Source: Cyr 2008; Cyr et al. 2005; Cyr et al. 2007)
Sat-1. This website appeals to me visually or emotionally
Sat-2. The website completely fulfills my needs and expectations
Sat-3. This website satisfies my needs well
Sat-4. Using this website is satisfactory overall

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