The influence of culture, emotions, intangibility, and atmospheric cues on online behavior

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ABSTRACT

This paper examines how emotions and website atmospheric cues influence service tangibility and consumer attitudes. The proposed model was compared across three cultures: North America (Canada and U.S.), China, and the Middle East. The findings support the overall model and demonstrate several non-invariant paths across the groups. Particularly, the results suggest how the influences of two emotional dimensions (pleasure and dominance) on consumer perceptions of site atmospherics vary across cultures. Moreover, the effects of service tangibility dimensions (physical tangibility, specificity, and mental tangibility) on consumers' attitudes toward the website and service vary significantly across the three cultures. Mental tangibility has the greatest influence on North American customers' attitudes, while physical tangibility and specificity have the greatest impact on Chinese and Middle Eastern customers' attitudes, respectively.

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1. Introduction

"Globalization and technology have combined to create a target marketplace mediated through the internet, which is truly international in scope" (Jin, 2010, 253). The last two decades saw an exponential growth in internet usage. In 1990 fewer than 1 million users were connected to the internet, but this number rapidly escalated to reach 1.6 billion by May of 2009 (Hill, 2011). E-commerce sales continually soar and the internet is becoming an equalizer, eliminating the constraints of location, scale, and time zones, while allowing firms, both large and small, to expand globally at a cost lower than ever before.

Several studies have developed online consumer behavior models and investigated the influence of website atmospherics on consumer behavior (Dailey, 2004; Eroglu, Machleit, & Davis, 2001, 2003; Hausman & Siekpe, 2009; Mummalaneni, 2005; Richard, 2005). Most of these studies adopted the Mehrabian and Russell (1974) Stimuli–Organism–Response (SOR) framework to explore the antecedents and consequences of website atmospherics. Based on the SOR framework, Eroglu et al. (2001) proposed that website atmospherics influence customers' emotional variables, which induce consumers' approach or avoidance behavior. More recently, Mazaheri, Richard, and Laroche (2011) developed a comprehensive model of online consumer behavior that included emotional and cognitive variables. They proposed that customers' emotions (pleasure, arousal, and dominance) are associated with the perceptions of site atmospherics (site informativeness, effectiveness, and entertainment), which in turn, influence site attitudes and involvement, product attitudes, and purchase intentions.

Zeithaml, Parasuraman, and Malhotra (2002) suggested that the website allows consumers to "make assumptions about the service's quality". Similarly, Eggert (2006) stated that companies must reduce customers' risk involved in purchasing a service, primarily by offering a "tangible" proof of quality and by "tangibilizing" the service to the greatest extent possible. The powerful function of the Internet in providing information to customers facilitates this task for marketers (Thakor, Borsuk, & Kalamas, 2004). Despite the significance of intangibility in the online consumer decision-making process, the influence of website atmospherics on intangibility has rarely been studied.

Intangibility was historically defined as "what cannot be seen, tasted, felt, heard, or smelled" (Kotler & Bloom, 1984). Laroche, Bergeron, and Goutaland (2001) conceptualized intangibility as a construct with three dimensions: physical intangibility, generality, and mental intangibility. Physical intangibility refers to the extent to which a product is *inaccessible to the senses*. Generality represents the degree of difficulty in "precisely defining or describing a particular product" (Laroche, McDougall, Bergeron, & Yang, 2004, 253). Mental intangibility refers to the degree of difficulty in visualizing a particular product. The first goal of this study is to investigate the influence of website atmospherics (site informativeness, effectiveness, and entertainment) on the three dimensions of intangibility.

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Furthermore, although online shopping is a global behavior, buying habits and determinants of website attractiveness are culturally bound (Jin, 2010). A firm must design a website and employ a creative strategy that will attract visitors from its various target markets. Through a study of online communications with respondents from the U. S., Egypt, China, and Germany, Seidenspinner and Theuner (2007) found that the targeted users' cultural environments may impact their preferred navigational tools, their perceived quality of web designs, as well as their perceptions of information provided online. Firms must research their target markets and use the information acquired to create websites that resonate with these users on all levels, including culturally. It is only the websites which attract and retain traffic that will influence their volume of business transacted and, ultimately, the profitability of the firms (Tarafdar & Zhang, 2007/2008). Thus, our second goal is to test our model in three cultures (North America, the Middle East, and China) and identify the non-invariant structural paths among the groups.

2. Literature review

2.1. Emotions

Several definitions of emotions are available in psychology and marketing literatures. Mehrabian and Russell (1974) developed three situational descriptors of emotions (PAD: pleasure, arousal, and dominance) to capture an individual's emotional responses to environmental stimuli. Therefore, the PAD framework is the most suitable framework for studies investigating the influence of atmospherics on consumer behavior. The PAD was adopted to conceptualize and operationalize emotions.

Pleasure is the degree to which one feels good, joyful, happy, or satisfied in any situation. In online contexts, pleasure is an indicator of the website "likeability" (Poels & Dewitte, 2008). Arousal is the degree to which one feels stimulated, active, or alert. In online contexts, arousal is an indicator of the website "motivational power" (Poels & Dewitte, 2008). Finally, dominance is the degree to which one feels unrestricted or free to act, controlling, influential, or autonomous. This dimension of dominance has been ignored in previous studies. Russell (1979) stated that pleasure and arousal can adequately represent the range of emotions exhibited in response to environmental stimuli. However, as Mazaheri et al. (2011) argued, dominance is a relevant emotional response as customers experience more control over their environment. In online contexts, dominance is an indicator of the website "controlling power" (Mazaheri et al., 2011). Therefore, we have included all three dimensions of emotions.

2.2. Site atmospherics

In traditional retailing, store environment and atmospherics are more influential than other marketing inputs that are not present at the point of purchase (Baker, 1987; Baker, Grewal, & Parasuraman, 1994). During the last decade, the evolution from traditional to online retailing has generated considerable managerial and research attention to the concept of site atmospherics.

Several studies have investigated the impact of atmospherics on the nature and outcomes of shopping in online retailing. Mehrabian and Russell's (1974) Stimulus–Organism–Response (SOR) framework is a suitable theoretical paradigm for online retailing environments. Similar to Donovan and Rossiter (1982) in traditional retailing, Eroglu et al. (2001) adapted the SOR paradigm to online marketing contexts. This was perhaps the first article to provide a framework for examining the influence of site atmospherics on online consumer behavior. The model suggested that atmospheric cues of the online store influence the response of online shoppers through the intervening effects of affective and cognitive states. Recently, Mazaheri et al. (2011) divided site environmental variables into two categories: affective (or passive) and cognitive (or reactive) atmospherics. Passive cues, such as text color, size, and background music, are the visual and aural dimensions of atmospherics that tend to subconsciously impact consumers' emotions upon initial exposure to the website. On the other hand, reactive cues, such as site informativeness, effectiveness, and entertainment, require customers' own evaluations, which are influenced by their emotions. Similarly, it is assumed that the three dimensions of emotions (pleasure, arousal, and dominance) are positively associated with a consumer's perception of site informativeness, effectiveness, and entertainment (Hypotheses H1a to H3c in Fig. 1).

Consistent with Richard (2005), as well as Mazaheri et al. (2011), three atmospheric cues are relevant. Site informativeness refers to the website's ability to make information available to visitors (Hoffman & Novak, 1996). Site entertainment is the extent to which a website is fun, exciting, cool, and imaginative (Chen & Wells, 1999) and site effectiveness is the degree to which the information on the website is accurate, up-to-date, complete, and relevant (Bell & Tang, 1998).

2.3. Service tangibility

Intangibility referred, initially, to the lack of physical evidence and was viewed as a single dimension (McDougall, 1987). More recently, Laroche et al. (2004) suggested that intangibility consists of three dimensions: physical intangibility, generality, and mental intangibility. The physical dimension is the extent to which a product cannot be accessed by the senses. The generality dimension is "the customer's difficulty in precisely defining or describing a particular good" (Laroche et al., 2004, 374). Finally, mental intangibility refers to the difficulty of visualizing a particular product; a product may be physically tangible, but hard to grasp mentally (Laroche et al., 2004). We use the term "tangibility", which is the opposite of "intangibility", and the term generality is replaced by its opposite: "specificity". This re-naming aids in the interpretation of results.

To offer an informative, effective, and even entertaining website would help customers evaluate the functionality and design of products. In service contexts, a customer may be able to virtually experience the service. For example, many hotels offer virtual tours of their rooms, lobby, and restaurants. Consumers can thus visualize and develop a sense of the facilities in and around a hotel room, helping them tangibilize the service. Therefore, we propose that site informativeness, effectiveness, and entertainment positively influence the three dimensions of tangibility (Hypotheses 4a to 6c in Fig. 1).

The internet enabled service providers to tangibilize some aspects of the intangible services, allowing customers to obtain rich information from websites, and thus evaluate the functionality and design of products, as well as make assumptions about the product's quality (Zeithamal et al., 2002). Reducing product intangibility reduces the level of risk perception (Laroche et al., 2004). The lower the risk involved in a service purchase, the easier customers form attitudes toward that service. Therefore, we expect the three dimensions of tangibility to positively influence site attitudes (H7a, H8a, and H9a in Fig. 1) and service attitudes (H7b, H8b, and H9b in Fig. 1).

2.4. National culture and customer behavior

As the title of Craig, Greene, and Douglas (2005) indicates, "culture matters". It has a profound influence on all aspects of consumer behavior. National culture is defined as patterns of thinking, feeling, and acting that are rooted in common values and societal conventions (Navakata & Sivakumar, 2001). For Hofstede (1991, p. 4) culture is "the collective programming of the mind". We adopted the two most widely accepted paradigms, namely Hall's (1976) contextual paradigm and Hofstede's (1980) five cultural dimensions, to compare the proposed model across three different cultures: North America (Canada and the United States), China, and the Middle East. The Middle Eastern countries are considered as one group or region because researchers, such as Kassem (1989), Gupta, Levinburg, Moore, Motwani, and Schwarz (2010), and Raven
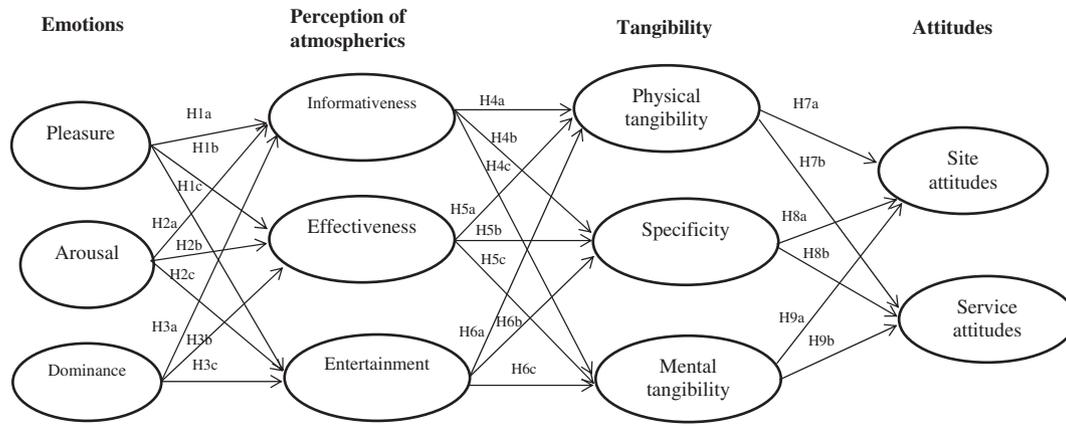
Fig. 1. Conceptual model.

and Welsh (2004) found that the Middle East has a unique culture with a distinctive way of life compared to other parts of the globe, which remains generally consistent throughout the region.

Contextual variations occur along a continuum, with Canada and the U. S. as low-context countries (Hall, 1976), the Middle East as a relatively higher-context region, compared to the U.S. and Canada, and China as a high-context culture at the extreme end of the continuum. Regarding Hofstede's (1980) dimensions, Canada and the U.S. score high on the individualist dimension, while China scores low and the Middles Eastern countries fall somewhere in between (Table 1). Both China and the Middle Eastern countries score higher in power distance than North America. The Middle Eastern countries score higher on uncertainty avoidance, while China scores higher on masculinity and long-term orientation compared to the other groups (Table 1).

Culture has been shown to influence marketing to these three groups in terms of advertising (Al-Olayan & Karande, 2000), consumer reactions to crowded retail settings (Pons, Laroche, & Mourali, 2006), product choice (Yucelt, 2000), and retail service quality perceptions (Raven & Welsh, 2004). Thus, consumers from North America, the Middle East, and China are expected to display significant differences in how they perceive website atmospherics, as well as how these influence their perceptions of service tangibility and their attitudes.

Previous studies reported different influences of emotions across cultures. Hsu (1983) used "low emotionality" as one characteristic of collectivism. High-context and collectivistic societies emphasize social norms and duty defined by the group rather than "pleasure" seeking (Triandis, 1995); therefore, emotional features are stronger in low-context and individualistic societies (Schimack, Radharkishnan, Oishi, Dzokoto, & Ahadi, 2002). Steenkamp and Geyskens (2006) proposed that the effect of emotional experience is larger in individualistic cultures. They found support for "pleasure" but not for "arousal". More recently, Mazaheri et al. (2011) reported several non-invariant structural paths between Canadian and Chinese groups. In particular, the influence of emotional dimensions on consumer perceptions of site atmospherics was determined to vary

between the two groups: "pleasure" had a greater impact for Canadians; while, "dominance" had a greater impact for the Chinese. Thus, we hypothesize that:

H10. The impact of pleasure on customer perceptions of (*a*) site informativeness, (*b*) site effectiveness, and (*c*) site entertainment is stronger for North American customers than for the other groups.

H11. The impact of dominance on customer perceptions of (*a*) site informativeness, (*b*) site effectiveness, and (*c*) site entertainment is stronger for Chinese customers than for the other groups.

Culture was also found to be an influential element in consumer response to online store atmospherics and high task cues, such as the site descriptors on the screen that facilitate shopping goal attainment, which are more central to the decision making process for individualistic customers (Davis, Wang, & Lindridge, 2008). Similarly, Mazaheri et al. (2011) found a stronger association between site informativeness, a high task cue, and affective and conative variables for Canadian customers compared to Chinese customers. Similarly, it is hypothesized that the influence of site informativeness on the three dimensions of service tangibility is greater for the North American group compared to the Chinese and Middle Eastern groups.

H12. The impact of site informativeness on (*a*) physical tangibility, (*b*) specificity, and (*c*) mental tangibility is stronger for North American customers than for the other two groups.

China scores high on long-term orientation, which is associated with service responsiveness in both online (Tsikriktsis, 2002) and offline (Furrer, Liu, & Sudharshan, 2000) settings. As a managerial implication for this association, Tsikriktsis (2002) suggested that companies avoid cluttered pages for customers that are highly long-term oriented. In other words, companies must offer an effective website. Therefore, we hypothesized that the influences of site effectiveness on the three dimensions of service tangibility is stronger for Chinese customers compared to North American and Middle Eastern customers.

H13. The impact of site effectiveness on (*a*) physical tangibility, (*b*) specificity, and (*c*) mental tangibility is stronger for Chinese customers than for the other two groups.

The low task cues, which are the site descriptors inconsequential to the completion of the shopping task, are rated as more helpful for collectivistic customers (Davis et al., 2008). Similarly, Mazaheri et al. (2011) found that site entertainment, a low task cue, had a greater impact for Chinese customers than for Canadian ones. Using Hofstede's

Table 1
Scores from Hofstede's five cultural dimensions for the four countries.

	U.S.	Canada	China	Middle East
Power distance	40	39	80	80
Uncertainty avoidance	46	48	30	68
Individualism	91	80	20	38
Masculinity	50	52	66	52
Long term orientation	29	23	118	NA

(1980) long-term orientation, Tsikriktsis (2002) suggested that companies must ensure that colors, graphics, and text are visually appealing and that the website is "entertaining" for the "high long-term" oriented customers. China scores much higher in "long-term orientation" and lower in "individualism" than the U.S., Canada, and the Middle East. Therefore, the influences of site entertainment on service tangibility are expected to be stronger for Chinese customers.

H14. The impact of site entertainment on (*a*) physical tangibility, (*b*) specificity, and (*c*) mental tangibility is greater for Chinese customers than for the other two groups.

Laroche et al. (2004) found that for North American customers, physical intangibility is the least important dimension of overall intangibility. The same result is expected in this study for the North American group.

H15. The impact of physical tangibility on (*a*) site attitudes and (*b*) service attitudes is stronger for the Chinese and Middle Eastern customers than for North American customers.

In high-context cultures, the building of trust and relationships occurs before any business takes place, whereas the reverse is commonly true in low-context cultures. Meaning is explicit in low-context cultures, where as in high-context cultures, meaning is derived based upon the context in which something is said, including the setting and the status of those involved. Individual achievement and individual welfare are of utmost importance in low-context cultures. In high-context cultures, the group and group harmony are top priority. In low-context cultures, communication is for information exchange, and that exchange of information is the primary reason for interaction. In high-context cultures, communication is for building relationships, and trying to create these relationships is the reason for interaction. Specificity refers to the customer's ability to precisely define or describe a particular product, thus the low-context customer is better able to evaluate the site and the service. A similar reasoning can be made for the impact of mental tangibility on site and service attitudes.

H16. The impact of specificity on (*a*) site attitudes and (*b*) service attitudes is stronger for the North American group than for the Chinese and Middle Eastern groups.

H17. The impact of mental tangibility on (*a*) site attitudes and (*b*) service attitudes is stronger for North American groups than for the Chinese and Middle Eastern groups.

3. Methodology

To test our model and to compare and contrast the structural paths across the groups, 25 real websites from eight different service industries were selected: hotels, online bookstores, dental services, banks, vacation destinations, restaurants, financial investment services, and plastic surgery facilities. Four websites for dental services, two for online bookstores, four for restaurants, two for financial investments, four for hotels, four for plastic surgery, three for vacation destinations, and two for banks were selected. Every attempt was made to include a wide range of services to increase the generalizability of the results.

Data were collected in two universities: one in the U.S. and one in Canada. Given the population of Middle Eastern and Chinese students in large Northeastern universities, a large sample of Middle Eastern and Chinese students was obtained. Students were asked to click on a link which randomly assigned them to one of the websites. The distribution of website categories to which the three groups (Middle Eastern, North American, and Chinese) was exposed is reported in Table 2.

Students were asked to surf the website and collect information about the service offered via the site. Subsequently, they were asked to respond to a series of survey questions. The duration of survey completion was monitored and subjects who completed the survey in less than 15 min were eliminated. To control for subjects' pre-existing attitudes toward the site, all respondents who had visited the assigned website prior to the experiment were eliminated. After the eliminations, the sample consisted of 179 American, 205 Canadian, 192 Middle Eastern, and 182 Chinese subjects.

3.1. Measurement

This study used Mehrabian and Russell's (1974) PAD scale to measure three emotional dimensions: pleasure, arousal, and dominance. Chen and Wells' (1999) scales measured website entertainment (4 items) and informativeness (4 items). The effectiveness of website information content was measured by a 5-item scale from Bell and Tang (1998). Laroche et al.'s (2001) 11-item scale of intangibility measured the three dimensions of intangibility. To reduce confusion, the "intangibility" items were re-coded to measure "tangibility", on which all analyses and hypotheses are based. Eighmey's (1997) scale for attitudes was modified to be a 5-item scale measuring website and service attitudes.

3.2. Analysis and findings

To assess the scale reliabilities, Confirmatory Factor Analysis (CFA) was run for all of the groups (Table 3). The results demonstrate a good measurement fit for all four groups, as all items have loadings higher than .5.

To test our model and compare the strengths of the relationships among the three groups, a three-group analysis in EQS is used. Before that, the U.S. and Canadian samples were merged into one group (low-context) and compared to the Middle Eastern and Chinese (high-context) groups. However, prior to merging the U.S. and Canada, assurance that the structural paths and loadings are invariant between the two groups was required. Therefore, a two-group analysis was conducted for the U.S. and Canada. The structural paths and loadings were then constrained to be equal between the two groups. The results suggested that the model improved when these constraints were imposed (Table 4). In other words, the two North American groups may be merged into one for the ensuing comparisons.

After merging the U.S. and Canadian groups, a 3-group analysis was conducted (Model 1 in Table 4). To compare the strengths of the relationships among the variables, factor loading invariance across the groups was examined (Bollen, 1989). As a result, measurement level constraints were introduced (Model 2, Table 4) before testing causal path invariance (Byrne, 1994). The chi-square difference between Model 2 and Model 1 (baseline) is 136 with df = 72 (p < .05). This indicates that constraining the loadings did not significantly improve the model. The multivariate $LM\chi^2$ statistics and related p-values revealed three non-invariant factor loadings: one item of site informativeness between the North American and Middle Eastern

Table 2
Distribution of respondents in each service industry.

Service industry	Middle Eastern (%)	North American (%)	Chinese (%)
Dental services	22.4	14.1	20.9
Online bookstores	5.2	1.5	3.3
Restaurants	10.9	9.3	9.3
Financial investments	9.4	4.9	8.8
Hotels	14.6	18.5	16.5
Plastic surgery	15.6	23.9	17.6
Vacation destinations	14.6	15.1	12.6
Banks	7.3	12.7	11.0
Total	100.0	100.0	100.0

Table 3
Results of the CFA for each group.

	χ^2	df	χ^2/df	NNFI	CFI	RMSEA
China	1730.28	983	1.76	.97	.97	.06
Middle East	1374.65	983	1.40	.98	.98	.04
Canada	1609.29	983	1.64	.98	.98	.05
U.S.	1471.44	983	1.50	.98	.99	.05

groups, one item of arousal between the Middle Eastern and Chinese groups, and one item of pleasure between the Middle Eastern and Chinese groups. Releasing these three constraints (Model 3) produced a satisfactory measurement model that was invariant among the three groups. The chi-square difference between Model 3 and the baseline model was 80 with df = 71 (p > .10). Therefore, partial metric invariance was supported.

Constraining the paths to be invariant across the three groups did not improve the model (Model 4 in Table 5); indicating that some paths are non-invariant between the North American, Middle Eastern, and Chinese groups.

After obtaining the partial factor loadings, the chi-square test was used to compare the structural path invariances. The results of the chi-square tests presented in Table 6 support the overall model. All hypotheses were significant at least in one group. More importantly, the majority of the paths (20 out of 24) were non-invariant between at least two groups.

Consistent with studies that utilized a dimensional approach for emotions (Menon & Kahn, 2002; Wang, Baker, Wagner, & Wakefield, 2007), the results suggest that the impacts of the three emotions vary. Specifically, the influences of pleasure on consumers' perceptions of site atmospherics (site effectiveness, site informativeness, and entertainment) are greater for the Middle Eastern group than for the two other groups (North America and China). Mazaheri et al. (2011) reported that the influences of pleasure are greater for Canadian customers compared to Chinese customers. When a new group was added between these two groups on the Hall high/low context continuum, the results changed in that, although it is in the right direction there is no statistical difference between the North American and Chinese groups. Similar to previous findings, the impact of arousal is mostly invariant across the groups. The influence of arousal on customer perceptions of site effectiveness was marginally stronger for the Chinese group than for the other two groups. On the other hand, the impact of dominance on consumers' perceptions of atmospherics is stronger for the high-context group compared to the low-context group. This finding is consistent with H11 and with Mazaheri et al. (2011).

The findings confirmed that the impacts of perceptions of site atmospherics on service tangibility are non-invariant across cultures. Consistent with H12, the influences of site informativeness on service tangibility dimensions are greater for the low-context culture; however, these impacts are not significant for the higher context cultures, the Middle East and China. This may come from the idea that interaction in low-context cultures is for information exchange. The information gained from website involvement would then help low-context culture consumers to tangibilize the service.

The impacts of site effectiveness on the three dimensions of service tangibility are stronger for the Chinese group than for the other

Table 4
Test of measurement and structural path invariance between the U.S. & Canada.

	Model (2-group analysis)	χ^2	df	$\Delta\chi^2$ from Model 1	Δdf from Model 1	p-value
1	No constraints	3465.2	2014			
2	Factor loading invariance	3507.1	2050	41.9	36	.23
3	Structural path invariance	3466.6	2038	1.38	24	.99

Table 5
Test of measurement invariance between the North American, Middle Eastern, and Chinese groups.

	Model	χ^2	df	χ^2/df	$\Delta\chi^2$ from Model 1	Δdf from Model 1	p-value	NNFI	CFI	RMSEA
1	Baseline model: No constraint	5717.9	3024	1.9				.98	.98	.059
2	Factor loading invariance	5854.3	3096	1.9	136.4	72	.00	.98	.98	.059
3	Partial factor loading invariance	5797.7	3093	1.9	79.8	71	.22	.98	.98	.059
4	Structural path invariance	5895.1	3072	1.9	177.2	48	.00	.98	.98	.060

two groups, supporting H13. The findings also suggest that site entertainment's impact on service tangibility dimensions is significant, but invariant across all groups, failing to support H14.

Consistent with expectations, the influence of service tangibility dimensions on site and service attitudes varies across cultures. The influences of physical tangibility on site attitudes and service attitudes are the strongest for the high-context culture of China, partially supporting H15. Also, the affects of specificity on site and service attitudes are stronger for the Middle Eastern and North American groups, partially supporting H16. As anticipated, mental tangibility had the strongest influences in the low-context culture of North America, supporting H17.

Overall, the findings can be summarized as follows:

1) For the North American group, all the paths in the model except two are significant; thus, the full model operates in North America, which should be of interest to website designers.
2) For the Chinese group, all the paths in the model except six are significant; the key aspects in the model are the: *a*) unique role of physical tangibility, the only dimension of tangibility that affects attitudes; *b*) important role of dominance in affecting website atmospherics; and *c*) important role of effectiveness in affecting tangibility.
3) For the Middle Eastern group, all the paths in the model except ten are significant; the key aspects in the model are the: *a*) unique role of specificity, the key dimension of tangibility that affects attitudes; *b*) important role of pleasure in affecting website atmospherics; and *c*) roles of effectiveness and entertainment in affecting tangibility.

From this summary, it is clear that there are very different paths for each culture in the formation of website and service attitudes, thus website designers should take these differences into account to achieve maximum effectiveness.

4. Discussion and managerial implications

"Globalization and advances in technology have not created global norms and homogenized our identities, but behavioral patterns and regional identities that are surprisingly durable" (Smith Speck & Roy, 2008, p. 1197). This study examined how customers' emotions and website characteristics influence service tangibility and customers' attitudes toward the service and the website. More importantly, the model was tested with three groups: the low-context countries of North America, the Middle East, and the high context country of China.

The findings confirm that internet users' cultural backgrounds do influence how they perceive the importance of specific web design

Table 6
Results of the invariance tests of the model across the three cultures.

Structural paths	Standardized β values			Comparisons		
	North America (NA)	Middle East (ME)	China	NA vs. ME	NA vs China	ME vs China
Pleasure → Effectiveness	.33	.51	.22	**2.85 (.09)**	.64 (.42)	**3.01 (.08)**
Pleasure → Informativeness	.38	.58	.34	**4.16 (.04)**	.16 (.69)	**2.95 (.09)**
Pleasure → Entertainment	.43	.61	.37	**4.39 (.04)**	.17 (.68)	**3.11 (.08)**
Arousal → Effectiveness	.04 n.s.	−.11 n.s.	.17	1.91 (.17)	**3.36 (.07)**	**4.70 (.03)**
Arousal → Informativeness	.18	.10 n.s.	.23	.49 (.48)	.63 (.42)	.73 (.39)
Arousal → Entertainment	.30	.29	.34	.01 (.94)	.21 (.64)	.24 (.62)
Dominance → Effectiveness	.56	.35	.67	1.4 (.24)	**3.65 (.06)**	**5.77 (.02)**
Dominance → Informativeness	.24	.09 n.s.	.45	2.15 (.14)	**5.15 (.02)**	**8.33 (.004)**
Dominance → Entertainment	.18	.06 n.s.	.31	1.04 (.31)	**4.10 (.043)**	**6.08 (.014)**
Effectiveness → Mental tangibility	.48	.49	.69	.02 (.89)	**3.74 (.05)**	**2.7 (.10)**
Effectiveness → Physical tangibility	.24	.24	.46	.03 (.86)	**4.08 (.04)**	**5.66 (.02)**
Effectiveness → Specificity	.34	.35	.60	.03 (.87)	**3.72 (.05)**	**3.89 (.05)**
Informativeness → Mental tangibility	.14	.02 n.s.	.12 n.s.	1.6 (.21)	.67 (.41)	.73 (.39)
Informativeness → Physical tangibility	.19	.04 n.s.	.15	**2.9 (.09)**	.04 (.85)	1.6 (.21)
Informativeness → Specificity	.20	.12 n.s.	.08 n.s.	1.92 (.17)	**2.92 (.09)**	.01 (.93)
Entertainment → Mental tangibility	.27	.20	.16	.57 (.45)	.63 (.42)	.08 (.78)
Entertainment → Physical tangibility	.35	.29	.48	.16 (.78)	2.49 (.11)	**3.61 (.06)**
Entertainment → Specificity	.34	.32	.19	.08 (.78)	**3.24 (.07)**	2.27 (.13)
Mental tangibility → Site attitudes	.42	.18	−.07 n.s.	**8.7 (.00)**	**9.8 (.00)**	1.8 (.18)
Physical tangibility → Site attitudes	.17	.08 n.s.	**.55**	.41 (.52)	**13.2 (.00)**	**13.8 (.00)**
Specificity → Site attitudes	.23	.35	−.09 n.s.	.71 (.40)	**3.18 (.07)**	**3.81 (.05)**
Mental tangibility → Service attitudes	.27	.05 n.s.	−.02 n.s.	**2.91 (.09)**	**2.94 (.09)**	.16 (.69)
Physical tangibility → Service attitudes	.06 n.s.	.08 n.s.	**.65**	.02 (.88)	**11.0 (.00)**	**8.94 (.00)**
Specificity → Service attitudes	.26	.35	.10 n.s.	.67 (.41)	**3.2 (.07)**	**4.4 (.03)**

features (Gevorgyan & Porter, 2008; Mazaheri et al., 2011). Congruent with Sia et al. (2009), customization is needed to account for cultural differences. The findings also suggest that the three emotional dimensional effects vary among the three examined cultures. Pleasure is the most influential element of emotions for Middle Eastern consumers, possibly due to the fact that people in high uncertainty avoidance cultures experience higher stress and have "less internalized emotional control" (Fernandez, Carrera, Sanchez, Paez, & Candia, 2000, p. 84). This lack of emotional control may contribute to the higher influence of pleasure in the Middle Eastern group than in the other groups. On the other hand, the influences of dominance on customers' perceptions of site atmospherics are the greatest for the Chinese. Similar to Mazaheri et al. (2011), the findings suggest that arousal has the lowest influence on consumer perceptions of site atmospherics. Service providers should thus use different techniques to increase visitors' feeling of pleasure and likeability of the website for Middle Eastern customers and the feeling of control over the website for Chinese customers.

Customers' perceptions of site atmospherics on service tangibility also vary across the three cultures. The impacts of site effectiveness on the three dimensions of service tangibility are the strongest for the Chinese group. Therefore, information provided for the Chinese customers must be convenient, accurate, up-to-date, complete, and relevant. Interestingly, the influences of site informativeness on the three dimensions of service tangibility are significant only for the North American group. Consequently, website designers should develop an informative and resourceful website for their North American customers. Site entertainment significantly influences the three dimensions of service tangibility for all groups, and thus must be a feature of any website design.

One contribution of this paper was to include service tangibility in the model. The findings suggest that the impacts of the three dimensions of service tangibility vary across the three groups. Particularly, mental tangibility effects on website and service attitudes are stronger for North American customers. Service providers must use technology in their website design to create a clear picture of their service in the minds of North American customers.

Also, the findings suggest that the impacts of physical tangibility on website and service attitudes are the strongest for the Chinese group. Interestingly, physical tangibility is the only influential dimension for the Chinese customers, as the impact of the other two dimensions is not significant for this group. Coming from a high-context culture, Chinese customers prefer to see and touch, or physically grasp, a product to form their attitudes. It suggests that service providers have a harder task of tangibilizing their services for Chinese customers. One alternative might be to include and promote the more tangible aspects of their services.

Finally, the specificity effects on website and service attitudes are the strongest for the Middle Eastern group. Interestingly, the influences of the other two dimensions of service tangibility on site and service attitudes are not significant, except for the influence of mental tangibility on site attitudes. This suggests that having a precise description of a service with many of its features is what shapes the Middle Eastern customers' attitudes. This may be because the Middle East is an emerging service economy, and thus its customers need to fully grasp the features of services offered online. Website designers must use technology to explain and demonstrate all features of the service and describe it in ways that Middle Eastern customers can understand.

Using the regional approach to website design would allow firms to take advantage of the similarities of all customers in a region in terms of language and culture to keep costs down while maximizing effectiveness. This study suggests that websites designed for North American, Middle Eastern, and Chinese customers must concentrate on different aspects to be more effective.

5. Limitation and future research

One should consider the limitations when interpreting the findings. Firstly, most respondents were students between the ages of 18 and 24 years. This group is the most familiar with Internet technology and uses the Internet most frequently. However, generalizing these findings to other segments must be done with caution. Future research might investigate the possible moderating impact of age on online consumer behavior. Our Chinese and Middle Eastern samples were foreign-born students enrolled in one of two North American universities. Given the fact that we found differences between these groups and the North American samples, one would expect to find even greater differences using real customers living in China and the Middle East.

Secondly, we created a utilitarian task for the respondents. They were asked to surf the website and collect information on the service offered. The found relationships might have been different if they were assigned a more hedonic task, such as shopping for a loved one. Future research may explore the impact of the nature of the task on the relationships in the model.

Finally, our purpose was to investigate online customer behavior. Respondents were exposed to the websites from a personal computer located in a behavioral lab. The rapid development of m(obile)-commerce now allows customers to navigate the firm's website from their mobile devices. Future study should explore customers' behavior in this new context.

Acknowledgments

References

Al-Olayan, F. S., & Karande, K. (2000). A content analysis of magazine advertisements from the United States and the Arab world. *Journal of Advertising, 29*(3), 69–82.

Baker, J. (1987). The role of environment in marketing services: The consumer perspective. In J. A. Czpeil, C. Congram, & J. Shanaham (Eds.), *The Services Marketing Challenge: Integrating for Competitive Advantage* (pp. 79–84). Chicago, IL: AMA.

Baker, J., Grewal, D., & Parasuraman, A. (1994). The influence of store environment on quality inferences and store image. *Journal of the Academy of Marketing Science, 22*, 328–339.

Bell, H., & Tang, N. K. H. (1998). The effectiveness of commercial internet web sites: A user's perspective. *Internet Research, 8*(3), 219–228.

Bollen, K. A. (1989). *Structural Equations with Latent Variables.* New York: John Wiley.

Byrne, B. M. (1994). *Structural Equation Modeling With EQS and EQS/Windows: Basic Concepts, Applications, and Programming.* Newbury Park, CA: Sage.

Chen, Q., & Wells, W. D. (1999). Attitude toward the site. *Journal of Advanced Research, 39*(5), 27–38.

Craig, C. S., Greene, W. H., & Douglas, S. P. (2005). Culture matters: Consumer acceptance of U. S. films in foreign markets. *Journal of International Marketing, 13*(4), 80–103.

Dailey, L. C. (2004). Navigational web atmospherics: Explaining the influence of restrictive navigation cues. *Journal of Business Research, 57*(7), 795–803.

Davis, L., Wang, S., & Lindridge, A. (2008). Culture influences on emotional responses to on-line store atmospheric cues. *Journal of Business Research, 61*, 806–812.

Donovan, R. J., & Rossiter, J. R. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing,* 34–57.

Eggert, A. (2006). Intangibility and perceived risk in online environments. *Journal of Marketing Management, 22*, 553–572.

Eighmey, J. (1997). Profiling user responses to commercial web sites. *Journal of Advertising Research, 37*(3), 59–66.

Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2001). Atmospheric qualities of online retailing: A conceptual model and implications. *Journal of Business Research, 54*(2), 177–184.

Eroglu, S. A., Machleit, K. A., & Davis, L. M. (2003). Empirical testing of a model of online store atmospherics and shoppers responses. *Psychology and Marketing, 20*(2), 139–150.

Fernandez, I., Carrera, P., Sanchez, F., Paez, D., & Candia, L. (2000). Differences between cultures in emotional verbal and non-verbal reactions. *Psicothema, 12*, 83–92.

Furrer, O., Liu, B. S., & Sudharshan, D. (2000). The relationships between culture and service quality perceptions. *Journal of Service Research, 2*(4), 355–371.

Gevorgyan, G., & Porter, L. V. (2008). One size does not fit all: Culture and perceived importance of web design features. *Journal of Website Promotion, 3*(1/2), 25–38.

Gupta, V., Levinburg, N., Moore, L., Motwani, J., & Schwarz, T. (2010). Family business in Sub-Saharan Africa versus the Middle East. *Journal of African Business, 11*(2), 146–162.

Hall, E. T. (1976). *Beyond Culture.* New York: Doubleday Press.

Hausman, A. V., & Siekpe, J. S. (2009). The effect of web interface features on consumer online purchase intentions. *Journal of Business Research, 62*, 5–13.

Hill, C. W. L. (2011). *Global Business Today.* New York: McGraw Hill Irwin.

Hoffman, D. L., & Novak, T. P. (1996). Marketing in hypermedia computer-mediated environments: Conceptual foundations. *Journal of Marketing, 60*(3), 50–68.

Hofstede, G. (1980). *Culture's Consequences: International Differences in Work-Related Values.* Beverly Hills, CA: Sage.

Hofstede, G. (1991). *Culture's Consequences: Comparing Values, Behaviors, Institutions and Organizations Across Cultures.* Thousand Oaks, CA: Sage.

Hsu, F. L. K. (1983). *Exorcising the Trouble Makers: Magic, Science, and Culture.* Westport, CT: Greenwood.

Jin, C. -H. (2010). An empirical comparison of online advertising in four countries: Cultural characteristics and creative strategies. *Journal of Targeting, Measurement and Analysis for Marketing, 18*(3/4), 253–261.

Kassem, M. S. (1989). Services marketing: The Arabian Gulf experience. *Journal of Services Marketing, 3*(3), 61–71.

Kotler, P., & Bloom, P. N. (1984). *Marketing Professional Services.* Englewood Cliffs, N.J.: Prentice-Hall.

Laroche, M., Bergeron, J., & Goutaland, C. (2001). A three-dimensional scale of intangibility. *Journal of Service Research, 4*(1), 26–38.

Laroche, M., McDougall, G. H., Bergeron, J., & Yang, Z. (2004). Exploring how intangibility affects perceived risk. *Journal of Service Research, 6*(4), 373–389.

Mazaheri, E., Richard, M. O., & Laroche, M. (2011). Online consumer behavior: A comparison between Canadian and Asian website visitors. *Journal of Business Research, 64*, 958–965.

McDougall, G. H. G. (1987). Determinants of ease of evaluation: Products and services compared. *Canadian Journal of Administrative Sciences, 4*, 426–446.

Mehrabian, A., & Russell, J. A. (1974). The basic emotional impact of environments. *Perceptual and Motor Skills, 38*, 283–301.

Menon, S., & Kahn, B. (2002). Cross-category effects of induced arousal and pleasure on the Internet shopping experience. *Journal of Retailing, 78*, 31–40.

Mummalaneni, V. (2005). An empirical investigation of Web site characteristics, consumer emotional states and on-line shopping behaviors. *Journal of Business Research, 58*, 526–532.

Navakata, C., & Sivakumar, K. (2001). Instituting the marketing concept in a multinational setting: The role of national culture. *Journal of the Academy of Marketing Science, 29*(3), 255–275.

Poels, K., & Dewitte, S. (2008). Getting a line on print ads. *Journal of Advertising, 37*(4), 63–74.

Pons, F., Laroche, M., & Mourali, M. (2006). Consumer reactions to crowded retail settings: Cross-cultural differences between North America and Middle East. *Psychology and Marketing, 23*(7), 555–572.

Raven, P., & Welsh, D. H. B. (2004). An exploratory study of influences on retail service quality: A focus on Kuwait and Lebanon. *Journal of Services Marketing, 18*(3), 198–214.

Richard, M. O. (2005). Modeling the impact of internet atmospherics on surfer behavior. *Journal of Business Research, 58*(12), 1632–1642.

Russell, J. A. (1979). Affective space is bipolar. *Journal of Personality and Social Psychology, 37*, 345–356.

Schimack, U., Radharkishnan, P., Oishi, S., Dzokoto, V., & Ahadi, S. (2002). Culture, personality, and subjective well-being: Integrating process models of life satisfaction. *Journal of Personality and Social Psychology, 82*(4), 582–593.

Seidenspinner, M., & Theuner, G. (2007). Intercultural aspects of online communication: A comparison of Mandarin-speaking, U. S., Egyptian and German user preferences. *Journal of Business Economics and Management, 8*(2), 101–109.

Sia, C. L., Lim, K. H., Leung, K., Lee, M. K. O., Huang, W., & Benbasat, I. (2009). Web strategies to promote internet shopping: Is cultural-customization needed? *MIS Quarterly, 33*(3), 491–512.

Smith Speck, S. K., & Roy, A. (2008). The interrelationships between television viewing, values and perceived well-being: A global perspective. *Journal of International Business Studies, 39*(7), 1197–1219.

Steenkamp, J. E. M., & Geyskens, I. (2006). How country characteristics affect the perceived value of web sites. *Journal of Marketing, 70*(July), 136–150.

Tarafdar, M., & Zhang, J. (2007/2008). Determinants of reach and loyalty: A study of website performance and implications for website design. *Journal of Computer Information Systems, 48*(2), 16–24.

Thakor, M. V., Borsuk, W., & Kalamas, M. (2004). Hotlists and web browsing behavior — An empirical investigation. *Journal of Business Research, 57*(7), 776–786.

Triandis, H. C. (1995). *Individualism and Collectivism.* Boulder, CO: Westview Press.

Tsikriktsis, N. (2002). Does culture influence web site quality expectations? An empirical study. *Journal of Service Research, 5*(2), 101–112.

Wang, L. C., Baker, J., Wagner, J. A., & Wakefield, K. (2007). Can a retail web site be social? *Journal of Marketing, 71*, 143–157.

Yucelt, U. (2000). Product choice in different cultures: An empirical investigation among Turkish consumers. *Journal of International Marketing and Marketing Research, 25*(2), 59–68.

Zeithamal, V. A., Parasuraman, A., & Malhotra, A. (2002). Service quality delivery through web sites: A critical review of extant knowledge. *Journal of the Academy of Marketing Science, 30*(4), 362–375.