

Applying relationship theories to web site design: development and validation of a site-communality scale

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Abstract. *Our study investigates whether relationship theories can be of help in designing web sites which foster greater customer loyalty. Based on literature reviews of Communal-Relationship Theory from Social Psychology, communality from marketing research and related concepts (e.g. commercial friendships), we develop and refine a multidimensional measure of 'site communality' using a sample of 305 participants. Each visited one among several real web sites chosen across three industries (i.e. banking, pharmaceuticals and insurance). We define site communality as the extent to which web site content signals that a company's relationship with its customers goes beyond the formal, 'tit for tat' business dealings that are typically expected from purely commercial exchanges, and instead, more closely abide by the norms and behaviours evocative of friendships and/or family relations. Our results indicate that demonstration of caring, role spanning and authenticity/genuineness are its most important dimensions. Preliminary findings also show that site communality is positively related to the benevolence dimension of online trust which is an important antecedent of loyalty. The practical implications of our study are discussed in the form of recommendations to help companies in designing web sites high in site communality.*

Keywords: web site interface design, communal-relationship theory, site communality, customer loyalty

INTRODUCTION

Online environments make fostering customer loyalty more challenging. They lower customer search costs and facilitate switching (Bakos, 1997). Even so, more and more companies are doing business online. Consequently, it is becoming increasingly important to identify web site

design factors which help attract and retain customers (Vijayasathay, 2004; Mithas *et al.*, 2007). Most studies have focused on identifying utilitarian factors (e.g. reliability, ease of use and navigation, meeting all the customer's transactional needs by offering rich content and functionality). Others have looked at entertainment value (e.g. flow – see Hoffman *et al.*, 2002) and to aesthetics (e.g. Chung & Tan, 2004). To our knowledge, only one study has considered applying relationship concepts in designing web sites which promote greater customer loyalty (i.e. Chen *et al.*, 2007). This is somewhat surprising given that research in Marketing squarely positions loyalty as a relationship concept (e.g. Fournier, 1998). Chen *et al.* (2007) investigated whether 'perceived touch' (taken from relationship marketing literature) could be beneficial in designing web sites to promote revisits. They defined perceived touch as 'the degree to which an online customer believes they can communicate well (. . .) with a Web-based system when performing online tasks and how well the system can aid them in their tasks (by being responsive, understanding, affective, helpful, interactive, and flexible)' (p. 70). Their results show that perceived touch has a significant and positive effect on users' decision satisfaction, attitudes toward the system and intentions to return to the site.

Our study aims to further contribute to this under-explored area of research. We begin by differentiating between exchange and communal relationships. Even though business relations are considered prototypical of exchange relationships, studies show that they can sometimes take on communal characteristics and can come to resemble friendships (Goodwin, 1996). Research conducted in traditional, face-to-face service settings shows that such relationships positively impact customer loyalty (Iacobucci & Ostrom, 1996; Price & Arnould, 1999).

Our study addresses the following questions: (1) *Can the precepts of Communal-Relationship Theory be communicated via web site content* and (2) *do such communications positively impact on customer loyalty?* For this, we develop and validate a multidimensional scale of site communality. We use LISREL 8.54 to analyze the data collected from 305 participants. Each visited and evaluated *one* of 28 real web sites spanning the banking, pharmaceuticals, and insurance industries. In testing for convergent validity, our results showed that site communality is positively related to the benevolence dimension of trust (see McKnight *et al.*, 2002), an important antecedent of customer loyalty (Chow & Holden, 1997). For future research, we present and discuss a conceptual model showing the expected impact of site communality on trust, satisfaction and loyalty. Finally, recommendations are provided to guide companies in designing web sites high in site communality.

COMMUNALITY

Studies in the area of Social Psychology have identified important differences between *communal* and *exchange* relationships (Clark, 1986; Clark *et al.*, 1987; Clark & Mills, 1993). Communal relationships are often exemplified by relationships between friends and family members. When we enter into a communal relationship with another person, we assume a general obligation to be concerned about that person's welfare. Our behaviours are motivated

by nurturing and caring for the needs of the other. We give benefits (e.g. offers of help, gifts, favours, affection) to please the other, as demonstrations of genuine concern and without an expectation of immediate repayment (Clark *et al.*, 1987; Clark & Mills, 1993).

Conversely, exchange relationships are economic and instrumental in nature. Relationship partners do not assume any obligation to feel concern for one another. Their behaviours remain more like those between polite strangers. These are the relationships we enter into because they are useful to us. We see them as a necessary means in achieving an end. Business and work relationships are often cited in the literature as prototypical examples. Similarly to communal relationships, benefits are given and received; but for different reasons. Benefits may be given as repayment for benefits received in the past or because an expectation exists that what is given today will be reciprocated in the near future. Consequently, in exchange relationships, partners tend to 'keep score' of what they have invested into the relationship relative to what they have gained from it. Because these are 'tit-for-tat' relationships, partners' perceptions of inequity can be particularly detrimental to the duration of exchange relationships. Unless equity is quickly re-established, exchange relationships are not likely to endure and may dissolve very rapidly (e.g. a disgruntled customer who's decides to take her business elsewhere).

Although commercial relationships are inherently exchange, they may take on communal characteristics (e.g. Goodwin, 1996; Price & Arnould, 1999; Harris *et al.*, 2000; Aggarwal, 2004; Aggarwal & Law, 2005). Studies show that some customers actually derive important social benefits from their interactions with service providers. Bartenders often serve as part of a social support network for their clients (Goodwin & Gremler, 1996) and some consumers may come to perceive their encounters with service employees as *a meeting among friends* (Price & Arnould, 1999). Goodwin (1996) refers to this phenomenon as 'communality' and defines it as *the extent to which a commercial relationship resembles a friendship*.

Most consumers in traditional, face-to-face service settings have either witnessed or experienced communality first hand. It is present when the bank teller at our local branch listens to the details of a customer's recent vacation or when your veterinarian enquires about your child's health. Such communications are unrelated to the customer/service-provider roles. This differentiates communality from, say, personalization. Communality is characterized by client/provider communication which is non-essential to the effective delivery of the service, signals caring and concern, and is perceived as voluntary and genuine (i.e. unscripted/unrehearsed – see Goodwin, 1996). Personalization, on the other hand, falls well within the bounds of exchange relationships, given that it aims at exploiting particular customer characteristics and preferences for business gains. Also, communality is not 'over-the-counter niceness'. The latter is often required from persons assuming their roles as employees and this behaviour is not necessarily genuine (Goodwin, 1996). A summary table of the differences between communal and exchange relationships is provided in Table 1.

Although some authors suggest that communal relationships imply some past interpersonal history or the expectation of an interpersonal future (Lydon *et al.*, 1997), Goodwin (1996) stresses that communality is not necessarily synonymous with a long-term relationship. Communality can appear between persons expecting no future interaction at all (e.g. confessional

Table 1. Important differences between communal and exchange relationship

Communal relationship/communality	Exchange relationships
<ul style="list-style-type: none"> • Exemplified by relations with friends and family • Genuine concern for the other's welfare; behaviours motivated by nurturing and caring for the needs of the other • Help likely to be provided; costs are incurred to benefit the other; record keeping is avoided • Benefits given voluntarily to please the other and in response to other's needs (no expectation of 'payback') • Self-disclosure; communication used to relating to the other on a personal, human level rather than strictly on an economic one; validation of what the other values outside of business 	<ul style="list-style-type: none"> • Relations between business partners • No obligation to feel concern for the other • Help is less likely to be provided if costs are high; record-keeping of individual inputs; expectation to receive compensation for favours • Benefits given as repayment for benefits received in the past or for those expected in the future • Communications are <i>role-bound</i> (i.e. between 'a customer' and 'an employee')

intimacy between strangers on a train). Whereas Goodwin (1996) presents communality mainly in the context of customer–employee relationships, other researchers have noted similar relational dynamics between customers as well. Many customers prefer physical to online shopping environments specifically because they enjoy interacting with other shoppers (Harris *et al.*, 2000). The ease with which communal relationships can arise between customers in traditional service settings continues to be one of its major advantages compared to online environments. Harris *et al.* (2000) provide a summary of past studies showing that anywhere between 13% and 33% of consumers recalled recently talking to other consumers (i.e. complete strangers) while out shopping (e.g. exchanging pleasantries, providing advice about products).

To our knowledge, our study is the first to investigate whether web sites can be designed to communicate communality between a company and consumers. We call this web site characteristic 'site communality'.

DEFINITION AND DIMENSIONALITY OF SITE COMMUNALITY

Our review of the literature on proper measure development and purification shows the following steps:

- 1 Construct definition (Murphy & Davidshofer, 1994);
- 2 Item generation (Churchill, 1979);
- 3 Content or face validity checks (Moore & Benbasat, 1991);
- 4 Internal validity via coefficient alpha and item-total correlations and exploratory factor analysis (Churchill, 1979); and

5 Confirmatory factor analysis (Gerbing & Anderson, 1988) and validation of the construct (Bagozzi & Yi, 1988).

To come up with a definition of site communality, we based ourselves on several sources. These included the literature from social psychology on communal relationships and friendships, the concept of communality (Goodwin, 1996) and related concepts in business research (i.e. commercial friendships – Price & Arnould, 1999). We define 'site communality' as *the extent to which web site content signals that a company's relationship with its customers goes beyond the formal, 'tit for tat' business dealings that are typically expected from purely commercial exchanges, and instead, more closely abide by the norms and behaviours evocative of friendships and/or family relations*. Importantly, although we conceptualize site communality as a characteristic of a web site, it stems from a subjective evaluation and is, thus, based on the visitor's perceptions of the web site.

Our review of the literature suggested a multidimensional structure. One important issue in multidimensional measure development is discriminant validity (Gerbing & Anderson, 1988). That is, the dimensions should be sufficiently different from one another even though they reflect the same underlying concept (Bagozzi & Yi, 1988). Although arguments can be made that there are other dimensions of site communality, we identified the following six from the literature. These were chosen because they appeared to be the 'recurring themes' in the literature on communality, communal relationships and friendship that we reviewed.

1 Conveying warmth/good cheer is the extent to which the content of the web site conveys a sense of friendliness and positive feelings toward customers. Studies that have explored friendship bonds have consistently shown that enjoyment of the other's company is a key element of friendships. This is often expressed by conveying warmth and positive emotion toward the other (Davis & Todd, 1982). Research in the areas of psychology, computer-mediated communications and advertising all clearly show that emotions such as warmth can be conveyed through various electronic media (e.g. Aaker *et al.*, 1986; Rice & Love, 1987).

2 Role spanning is the extent to which web site content demonstrates that the company sees the visitor/user as 'a person' rather than strictly 'a customer' and attempts to relate with the visitor/user on a personal as well as on a commercial level. This dimension stems from Goodwin's (1996) observations that communality is often evidenced through conversations which go beyond those which are strictly required for the effective delivery of the service. As such, communal communications transcend the 'service script'. Although unessential to service delivery, such communication is meant to convey caring, warmth and interest in the other (e.g. 'small talk' in traditional service settings). By extension, role spanning may be thought of as the ability of web sites to make visitors disassociate, even temporarily, from their roles as customers by acknowledging (via images or other types of content) important aspects of their lives unrelated to business. It represents attempts at relating to visitors/users on a personal, human level rather than strictly on an economic one. This may include the addition of content which acknowledges aspects of customers' personal lives (e.g. images which evoke the importance of family). Research in social psychology further affirms the relevance of this

dimension by showing that affirmation and validation of another's values and life experiences are salient characteristics of friendships (Bigelow, 1977).

3 Approachability is the extent to which the web site's content makes the visitor feel that the company facilitates, encourages and is receptive to customer contact. Keeping track of the other's needs and exhibiting helping behaviours are greater in communal than in exchange relationships (Clark *et al.*, 1987). Helping a person clarify his/her understanding of problems or solutions (a.k.a. cognitive guidance) is identified as an important component in social support between friends (Pagel *et al.*, 1987). Research also shows that simply thinking of a friend (versus a co-worker) increases our willingness to help others (Fitzsimons & Bargh, 2003).

4 Demonstration of caring is the extent to which web site content indicates that the company behaves in a caring and nurturing manner with its customers. Our inclusion of this dimension is based directly on the work on communal relationships by Clark and her colleagues. One of the characteristics which separates communal from exchange relationships is that behaviours associated with communal norms are motivated by nurturing, empathy and caring for the needs of the other and a general obligation to be concerned about the other person's welfare. Conversely, exchange relationships are characterized by a limited emotional investment in the relationship (Clark *et al.*, 1987; Clark & Mills, 1993).

5 Self-disclosure is the extent to which web site content reveals to users/visitors the company's non-commercial related activities, involvements and/or interests. Self-disclosure is an important characteristic which separates friends from mere acquaintances (Hornstein & Truesdell, 1988). In the context of our study, it represents the extent to which the web site exposes visitors to other facets/interests of the company rather than simply to what it has for sale. This dimension is somewhat related to role spanning, given that it too entails communications which are unrelated to business activity. However, the two should be thought of as opposite sides of the same coin. Role spanning entails a valorization and recognition of aspects in the customer's life outside of business. Self-disclosure involves a company's efforts to reveal aspects about itself which are unrelated to its core business activity. This may include informing visitors of any non-profit foundations the company may be sponsoring or may be involved with.

6 Authenticity/genuineness is the extent to which web site content conveys that a company's feelings and concerns for its customers are genuine rather than simply instrumental in achieving some goal (e.g. more sales). Researchers in psychology have revealed that the motivation to adhere to communal norms can be altruistic, selfish or driven by some other reason (e.g. marrying someone strictly for money while faking feelings of love – see Clark & Mills, 1993). Similar findings have been noted in studies of commercial relationships as well. Some companies actually train/require employees to effectively fake the affective component of service delivery in order to increase sales. Waiters and flight attendants are often expected to express caring as a work requirement (Tsai & Huang, 2002). Such behaviours are not always perceived as sincere. Some consumers find the idea of experiencing genuine communal relationships in commercial settings oxymoronic, manipulative and quite absurd (Barnes, 1997).

CONTENT VALIDITY AND EXPLORATORY FACTOR ANALYSIS

Generation of an initial pool of items yielded 37 items: (a) conveying warmth/good cheer (seven items), (b) approachability (seven items), (c) demonstration of caring (six items), (d) authenticity/genuineness (six items), (e) role spanning (six items), and (f) self disclosure (five items) (see Appendix 1). Card sorting was used for content validity (Moore & Benbasat, 1991). Ten judges were recruited at one of the universities in Montreal, Quebec, Canada. This included PhD students, faculty members and administrative staff. A cut-off of 0.70 was used, that is, seven out of 10 judges had to be able to correctly assign an item to its corresponding dimension. We retained 33 items.

A first online questionnaire was developed using Perseus SurveySolutions 6. All items were 7-point Likert-type, ranging from (1)-*strongly agree* to (7)-*strongly disagree*. Included were links to nineteen (19) real web sites across three industries (i.e. banks, insurance and pharmacies). These online service industries were chosen for this study because they have attracted considerable consumer interest. More specifically, 57% of households with internet access use online banking (Statistics Canada, 2004), 66% of respondents to an online survey report visiting online pharmacies (Brownell, 2005), and 29% of all consumers have already used the internet to shop for auto insurance (J.D. Power & Associates, 2004). Yahoo and Google searches were used to compile an initial list of web sites (about 40) across these three online industries. We then visited each site and chose to retain nineteen of them to be included in the questionnaire. Based on the theoretical dimensions of site communality identified in the literature, we felt that these 19 sites would maximize variance in site communality. The web sites included into questionnaire 1 are identified in Appendix 2.

Each participant was instructed to evaluate one of these 19 sites. To control for confounding effects of past experiences (be they good or bad), the questionnaire instructed participants to choose to evaluate the web site of a company which they were unfamiliar with. Participants were asked to explore this site for about 10 minutes, until they were confident of their overall impression.

Invitations were posted on bulletin boards across several university campuses and at two Walmart stores in Houston, Texas. A total of $n_1 = 249$ questionnaires were collected. The largest proportions of participants were students (65.5%). A little more than half (51.4%) were male. A substantial portion (47.8%) was in the 18–21 age group. The next highest were between 22 and 24 (26.5%) followed by those 25 to 29 years of age (9.6%). In terms of race/ethnicity, the largest groups of respondents were 'Black/African-American' and 'White/Caucasian' (35.3% and 34.9%, respectively) followed by 'Hispanic/Latino' (13.3%). Appendix 2 shows the distribution of respondents per web site and per industry.

Item purification involved examining coefficient alphas (≥ 0.7 ; Nunnally, 1967) and corrected item-to-total correlations (≥ 0.5 ; Zaichkowsky, 1985). All reverse-coded items were recoded prior to analysis. We conducted exploratory factor analysis (EFA) with oblimin rotation in SPSS 12.0. The extraction was forced to a six-factor solution in an attempt to reproduce the theorized dimensionality of site communality. We retained items with loadings (>0.40) on their hypothesized factor and low cross-loadings (<0.40). Items dropped during EFA are identified

in Appendix 1. The initial dimension of conveying warmth/good cheer lost items reflecting 'warmth'. After examining the remaining items, the dimension was simply renamed 'Good Cheer'. All Cronbach alphas were above the 0.7 cut-off.

CONFIRMATORY FACTOR ANALYSIS

The remaining items were included into a second online questionnaire (questionnaire 2). Twenty-eight web sites were chosen across the same three industries (see Appendix 2). Nine new web sites were added to the 19 used in questionnaire 1. As before, these were chosen by the authors so as to try to maximize variance in site communality. Again, participants were instructed to evaluate only one among these with the restriction that the site and company be unfamiliar to them. Seven hundred invitations for the second online study were printed and posted on bulletin boards across university campuses in Texas, Vermont, Quebec and Ontario.

A total of 358 electronic questionnaires were returned. Duplicate cases and cases with random responses were removed. We also flagged, as potential outliers, cases where the probability of Mahalanobis $D^2 > 0.01$. A visual inspection helped separate cases which were true outliers from those which could be considered unlikely but possible. Final sample size was $n_2 = 305$. Appendix 2 shows the distribution of respondents per web site and per industry.

Of the participants, 50.2% were male. Most were students (72.4%). The largest proportion was in the 18–21 and the 22–24 age brackets (41.0% and 30.2%, respectively). For the 25–29 and 30–39 age groups, the figures were 11.5% and 10.8%, respectively. For race/ethnicity, the largest were 'White/Caucasian' and 'Asian' at 59.0% and 17.4%, respectively.

Analysis of skewness and kurtosis revealed that our sample was not normally distributed (West *et al.*, 1995). Although 'maximum likelihood' (ML) estimation in structured equation modelling is robust against moderate violations of normality when $n > 100$ (Tanaka & Huba, 1984), ML is based on a strong assumption of multivariate normality. The greater the deviation, the more ML tends to inflate the chi-square statistic (χ^2) which becomes biased toward Type I error. This bloating effect often leads researchers to reject or modify models which may not be incorrect. Different approaches are available to correct this problem. We opted for the *Satorra-Bentler rescaled chi-square statistic* (Satorra & Bentler, 1994) which has the desirable property of simplifying to the original ML χ^2 under multivariate normality (West *et al.*, 1995).

First- and second-order confirmatory factor analyses (CFA) were run using LISREL 8.54. Items were dropped based on (1) Low/non-significant factor loadings (<1.96), (2) low squared multiple correlations (<0.30), (3) high standardized residuals and (4) modification indices suggesting high cross-loadings (Bollen, 1989). In the first-order CFA, items RS2, AP2 and SD3 were dropped. Standardized loadings (λ_{xs}) for the remaining indicators were all acceptable (0.74 to 0.95) with significant t -values (6.56 to 25.15). Squared multiple correlations for the remaining items were above 0.30, indicating that each tapped well into its intended factors (Bollen, 1989). The standardized solution is presented in Figure 1.

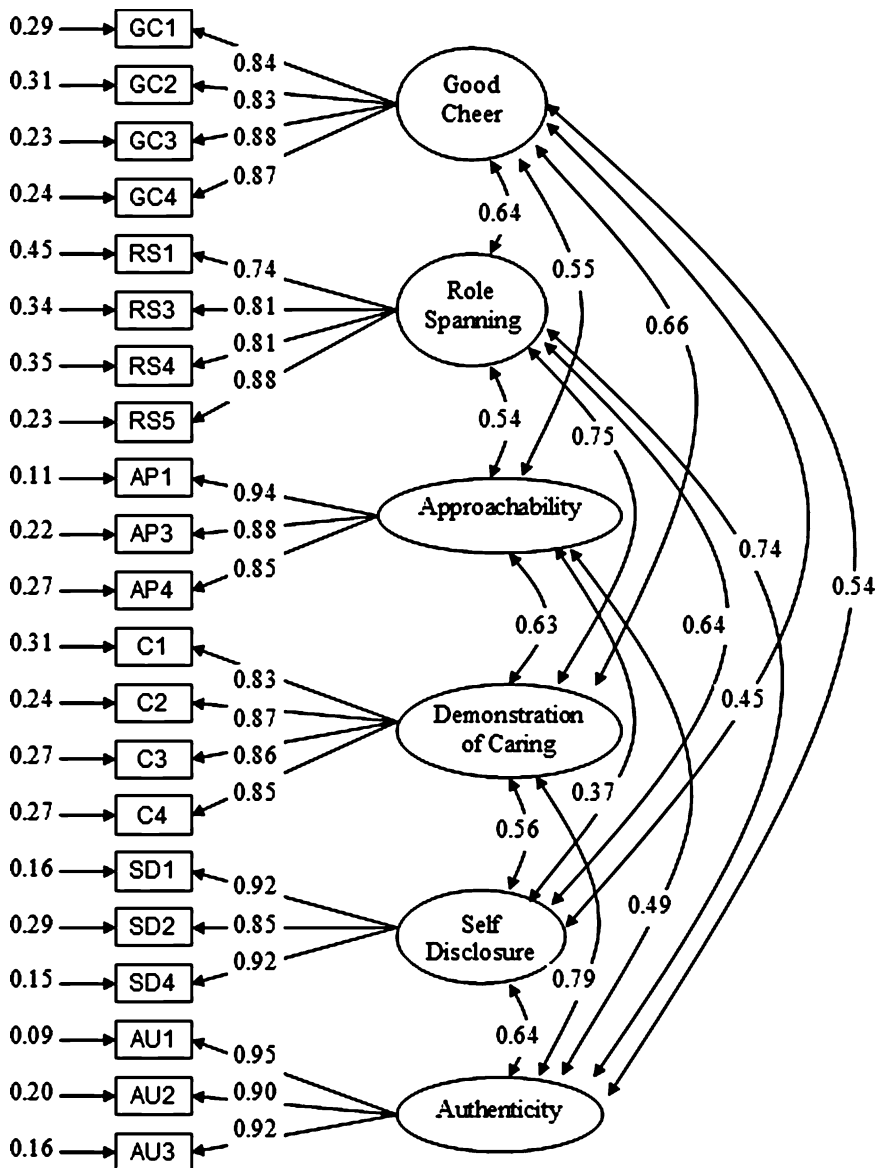


Figure 1. First-order confirmatory factor analysis.

The most common means of evaluating model fit is the chi-square goodness-of-fit (χ^2) test. Non-significant χ^2 show that the model provides an adequate representation of the data. However, Jöreskog & Sörbom (1996) point out that large χ^2 values are a common finding and that it has become general practice for researchers to rely on other indices of fit. Moreover, Hu

Table 2. Fit indices for first-order confirmatory factor analysis (CFA)

Fit index	Recommended value	First-order CFA model
χ^2	$P > 0.05$	264.78 (d.f. = 174, $P = 0.00001$)
NFI	>0.90	0.98
CFI	>0.90	0.99
IFI	≥ 0.90	0.99
RMSEA	≤ 0.05	0.041
ML(χ^2)/d.f.	<3	1.70
SRMR	<0.08	0.037

NFI, Normed Fit Index; CFI, Comparative Fit Index; IFI, Incremental Fit Index; RMSEA, Root-Mean-Square Error of Approximation; ML, maximum likelihood; SRMR, Standardized Root Mean Square Residual.

& Bentler (1999) found that Type I and Type II errors occurred much less frequently when decisions to reject/retain models were based on a combination of fit indices. Additional fit indices included in our analysis were: the Normed Fit Index (NFI), the Comparative Fit Index (CFI), the Incremental Fit Index (IFI), the Root-Mean-Square Error of Approximation (RMSEA), the Normed Chi-square (i.e. χ^2 /d.f.) and the Standardized Root Mean Square Residual (SRMS) (see Steiger, 1989; Bentler, 1990; Browne & Cudek, 1993; Hartwick & Barki, 1994; Jöreskog & Sörbom, 1996; Hu & Bentler, 1999). Although χ^2 suggested poor fit, additional indices showed that, overall, the model fit the data well (see Table 2).

The second-order CFA model is presented in Figure 2. The standardized factor loadings (λ_{ys}) for the indicator variables were all above the recommended 0.6 (Bagozzi & Yi, 1988), ranging from 0.74 to 0.96, and their t -scores indicated that all item loadings were significant ($P < 0.001$). Although the model revealed a $\chi^2 = 312.71$ ($P = 0.00000$) with d.f. = 183, other fit indices indicated that the model displayed good fit (NFI = 0.98, CFI = 0.99, IFI = 0.99, RMSEA = 0.048, SRMR = 0.051). The first-order factors all loaded significantly on the second-order factor (γ s ranged from 0.64 to 0.91; $P < 0.001$) suggesting that the first-order dimensions 'reflected' site communality well. The loadings indicate that *demonstration of caring*, *role spanning* and *authenticity/genuineness* (in that order) are the most important dimensions of site communality. Cronbach alphas were 0.916 for *good cheer*, 0.883 for *role spanning*, 0.921 for *approachability*, 0.914 for *demonstration of caring*, 0.922 for *self-disclosure*, and 0.945 for *authenticity/genuineness*.

POWER ANALYSIS

Power is a probability which reflects a researcher's ability to recognize and reject (not reject) poor (good) models. It is a critical but often neglected aspect in the analysis of structural equation models (Chin, 1998). Without sufficient power, 'statements of support of models must be considered highly suspect' (MacCallum *et al.*, 1996, p. 142).

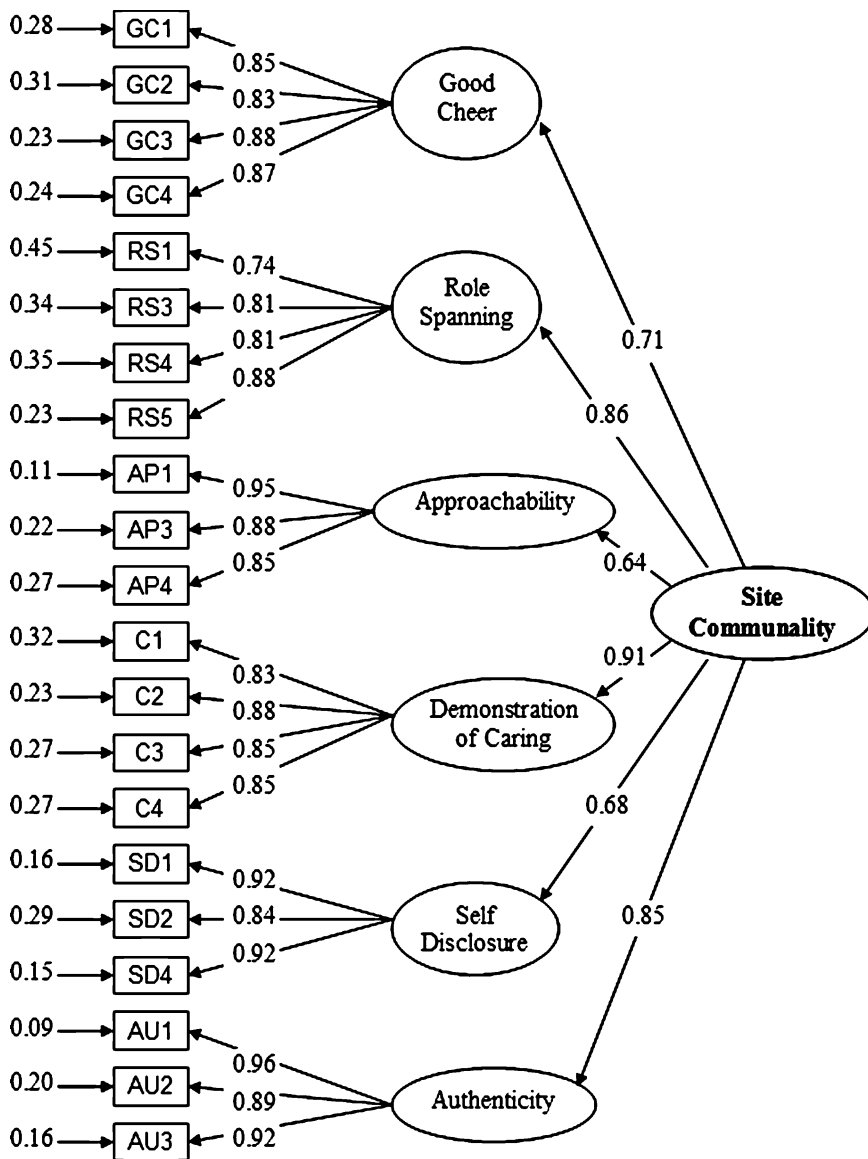


Figure 2. Second-order confirmatory factor analysis.

Although alternative methods exist to assess statistical power, we used the method devised by MacCallum *et al.* (1996) because of its simplicity and ease of implementation. A $100(1-2\alpha)\%$ confidence interval is first constructed around the point estimate value of RMSEA. We refer to this confidence interval as CI_{RMSEA} . One can expect, with $100(1-2\alpha)\%$ confidence, that

the true (but unknown) value of RMSEA is somewhere within CI_{RMSEA} . The CI_{RMSEA} is then examined in relation to cut-off values used by researchers to distinguish between good or poor fit. Steiger (1989) proposes that 0.05 represents the largest value RMSEA can take while still indicating good (close) fit. Hu & Bentler (1999) recommend a maximum value of 0.06 for reasonable fit. Values in the range of 0.08 to 0.10 are indicative of mediocre, poor or 'not-close' fit (MacCallum *et al.*, 1996).

The MacCallum *et al.* (1996) method recommends an examination of the bounds of CI_{RMSEA} relative to the 0.05 cut-off value. One of three situations can occur: (1) the entire CI_{RMSEA} lies below 0.05, (2) the entire CI_{RMSEA} lies above 0.05 or (3) the CI_{RMSEA} contains the value 0.05. The first case provides the clearest support for good (close) fit because one can say, with $100(1-2\alpha)\%$ confidence, that both the point estimate value and the true (but unknown) value of RMSEA are smaller than 0.05. This situation tends to occur when (1) the fit of the model is very good (i.e. a point estimate of RMSEA closer to 0), (2) the sample size is large, and (3) the degrees of freedom are high. Together, these conditions lead to a narrow CI_{RMSEA} which spans around an already low RMSEA value. In the second situation, the entire CI_{RMSEA} is above 0.05. This offers strong support for concluding that the model is a poor approximation of the real-world phenomena under study. In the third situation, CI_{RMSEA} contains the value 0.05. This situation is ambiguous because the real value of RMSEA can be smaller, equal or larger to 0.05. In this case, the model is considered neither good nor bad.

Next, the MacCallum *et al.* (1996) method assesses statistical power by conducting two tests. The first is called the *test of close fit*. It is described as follows; if the true value of RMSEA is actually quite large (i.e. 0.08) indicating poor fit and we test the hypothesis that fit is good ($H_{0 \text{ close fit}}: RMSEA \leq 0.05$), what is the probability that this null hypothesis is rejected? The second is called the *test of not-close fit*, and can be expressed in the following way; if the true value of RMSEA is actually close to zero (i.e. 0.01) indicating very good fit, and we test the hypothesis that fit is not good ($H_{0 \text{ not close}}: RMSEA \geq 0.05$), what is the probability of rejecting the null hypothesis?

MacCallum *et al.* (1996) provide both tables to estimate power and computer code which can be input into SAS. Software also exists. We used a computer program called NIESEM, which was developed by Paul Dudgeon, a professor with the Department of Psychology at the University of Melbourne. It is available as freeware at <http://rubens.its.unimelb.edu.au/%7Edudgeon/>. Prior to conducting the power analysis of our second-order confirmatory factor model, we tested this program for computational accuracy by using the examples presented in MacCallum *et al.* (1996).

Our second-order confirmatory factor model yielded a 90% CI_{RMSEA} with bounds of 0.0390 and 0.0573. Although the point estimate value of RMSEA (i.e. 0.048) suggested a good fit (Steiger, 1989), the upper bound value of 0.0573 indicated the possibility that the true value of RMSEA was above 0.05. Consequently, it was not implausible that our model had less than good fit. We also noted that the 90% CI_{RMSEA} was below the recommend maximum value for reasonable fit of 0.06 (see Hu & Bentler, 1999). Based on this analysis, we concluded that model fit of our second-order confirmatory factor model was actually somewhere between reasonable and good.

Power estimates were then calculated to give us an indication of how confident we should be of this conclusion regarding model fit. The NIESEM program results indicated that our second-order confirmatory factor model had more than adequate statistical power. For the *test of close fit*, we found a value for power equal to 1.0. This showed a 100% probability of rejecting $H_{0 \text{ close}}$: $\text{RMSEA} \leq 0.05$ (i.e. a hypothesized good fit) if the true fit is actually mediocre. For the *test of not-close fit*, the result was nearly identical. Power was 0.999 representing close to a 100% probability of rejecting $H_{0 \text{ not close}}$: $\text{RMSEA} \geq 0.05$ if the true fit is actually extremely good. Power tests were then repeated using the reasonable fit cut-off criteria (i.e. $H_{0 \text{ close}}$: $\text{RMSEA} \leq 0.06$, $H_{0 \text{ not close}}$: $\text{RMSEA} \geq 0.06$). Again, power estimates greater than 0.99 were obtained for both the close and not-close tests.

In addition, it is worth noting that statistical power is positively related to both sample size and degrees of freedom (MacCallum *et al.*, 1996). As such, power can help researchers determine minimum sample size requirements. For our study, the NIESEM program estimated that a sample size of about 170 was needed to achieve a power level of 0.99. This provided further evidence that our actual sample size of 305 was more than adequate.

CONSTRUCT VALIDITY

Construct validity is made up of two separate but related issues: Convergent and discriminant validity (Anderson & Gerbing, 1988). Convergent validity is the extent to which a scale correlates highly with other scales that measure the same construct. A test for convergent validity pertains to examining whether the proportion of variation in the indicators captured by the underlying construct (i.e. 'average variance extracted' – AVE) is higher than the variance as a result of measurement error (Fornell & Larcker, 1981). The values of AVE for each of our dimensions of site communality exceeded the suggested critical value of 0.50 supporting convergent validity.

For the second-order factor, convergent validity was established by examining the extent to which it correlated positively with another scale measuring the same concept. Our second-order factor model was correlated with a measure of overall site communality made up of the following items: Item 1 (*This web site makes users feel like they are dealing with friends rather than strangers*), item 2 (*This web site makes you feel like you can expect more than a 'strictly business' relationship from this company*), item 3 (*This web site makes visitors feel like they will be treated 'like family'*) and item 4 (*This web site shows this company has many of the qualities which I'd look for in a friend*). Cronbach alpha for the overall site-communality scale was 0.887.

The correlation between site communality and overall site communality was significant, positive and large (0.84). To get a better idea of this correlation's relative magnitude, we correlated our second-order measure of site communality with one of the dimensions of online trust (McKnight *et al.*, 2002), namely, *benevolence*. Although the correlation between site communality and benevolence (0.84) was positive and significant, it was considerably less than that between site communality and the overall measure. We took this to indicate good

convergent validity. It is worth noting that the concepts of communality and benevolence are conceptually related but different (Goodwin, 1996). Site communality is a friendship-like feeling created by exposure to the content of a company's web site and is probably one among several factors which may positively influence customers' perceptions of benevolence. For instance, we know that enhancing perceptions of web site privacy protection positively influences customer trust (Metzger, 2004). These come in the form of privacy statements and seals indicating to customers that a company will not be deceitful and that it vows to protect their customers' welfare. While this is likely aimed at signalling that a company has integrity, the willingness to make such promises in writing on a web site may signal benevolence to customers.

Discriminant validity was our next concern. It represents 'the extent to which the measure is indeed novel and not simply a reflection of some other variable' (Churchill, 1979, p. 70). We did expect to find somewhat high correlations between the dimensions of site communality given that these reflect a common underlying construct. In such situations, correlations of 0.70 and 0.80 are not uncommon (Grewal *et al.*, 2004). To ensure that our dimensions of site communality were indeed different from one another, we formed 95% of confidence intervals with the standard error of the correlation between dimensions and found that none of the confidence intervals contained the value of ± 1 (see Anderson & Gerbing, 1988; Bagozzi *et al.*, 1991). A second test consisted of setting, one at a time, the correlations between the first-order factors equal to one and testing for significant improvements in chi-square (Anderson & Gerbing, 1988). Chi-square comparison tests revealed that the 'unconstrained' model was always significantly better. This further suggested good discriminant validity.

Given the high correlations between some of our variables (e.g. .79 between demonstration of caring and authenticity/genuineness; 0.75 between role spanning and demonstration of caring), we also considered the possibility of multi-collinearity in our model. Discriminant validity and multi-collinearity are related. The latter refers to the existence of redundancy among variables which are meant to be conceptually different. It can lead to many adverse effects in SEM such as solutions which fail to converge. Even when a solution can be generated, multi-collinearity can lead to inaccuracy in parameter estimates and can increase the likelihood of Type II errors (Grewal *et al.*, 2004). A factor correlation value ≥ 0.85 is a general threshold value commonly used to suggest that multi-collinearity is producing ill effects in a structural equation model (see Kline, 1998). None of our factor correlations was equal to or greater than 0.85. Whereas this method did not completely rule out the presence of multi-collinearity in our model, it did suggest that multi-collinearity was not problematic.

LIMITATIONS AND FUTURE RESEARCH

Our study has limitations. First, although we tried to apply a rigorous validation process for developing our measure of site communality, we used data samples gathered mostly among University students between 18 and 29 years of age. These respondents are regular web users

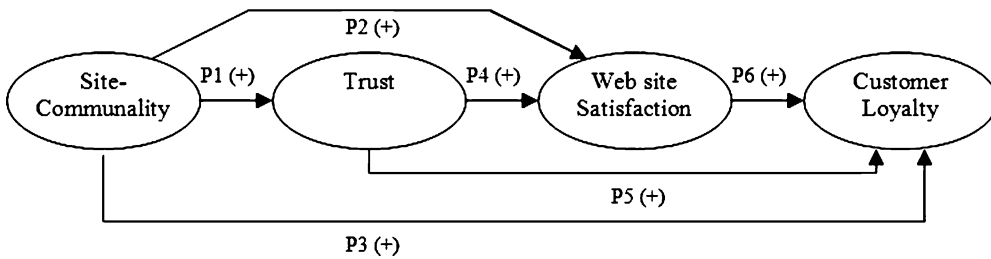


Figure 3. Expected effects of site communality on trust, satisfaction and loyalty.

(i.e. for school work, checking emails). Moreover, they are close to the online consumer population in terms of age and education (McKnight *et al.*, 2002). However, cross-validation using another sample more representative of the 'average online consumer' would be advisable for greater generalization. Galletta & Lederer (1989) have proposed that test-retest is necessary for establishing the reliability of new measures. A future study could examine the stability of our site-communality instrument using the test-retest correlation method.

Next, research conducted in traditional, face-to-face service settings clearly shows that communality (and closely related concepts) positively impacts customer loyalty (Iacobucci & Ostrom, 1996; Macintosh & Lockshin, 1997; Price & Arnould, 1999; Gremler & Gwinner, 2000). Our study has tried to extend these findings to online environments as well. The analysis we conducted to establish convergent validity for site communality provides some evidence of such benefits. The positive correlation of 0.49 between site communality and the 'benevolence' dimension of online trust clearly warrants further research, given that trust plays a central role in generating online customer satisfaction (Urban *et al.*, 2000) and helps foster attitudes and promote behaviours associated with customer loyalty (Gefen, 2000; Jarvenpaa *et al.*, 2000; Lynch *et al.*, 2001). We propose the model in Figure 3 as future research.

Several empirical studies have evidenced the importance of creating satisfying online experiences for customers (e.g. Szymanski & Hise, 2000; Anderson & Srinivasan, 2003; Wu & Padgett, 2004). Empirical studies show a positive association between satisfaction and loyalty (e.g. Auh & Johnson, 2005). According to Oliver (1980), satisfaction is believed to influence the consumer's post-exposure/post-usage attitudes which then influence his/her repurchase intentions (a behavioural proxy often used by researchers to measure loyalty). We believe that the relationship between site communality and web site satisfaction is most likely complex but positive. Research in both marketing and psychology provides conjectural support for this. Studies conducted in traditional service settings show that when employees smile more, increase eye contact and extend more greetings to customers (i.e. expressions of positive emotions associated with communal-relationships), customers experience more positive moods and that such mood effects have a positive influence on customers' service experiences (Pugh, 2001). This likely occurs as a result of a process called 'primitive

emotional contagion'. Expressions of positive emotions during interpersonal interactions often induce matched emotional states through a process of emotional mimicry (Hatfield *et al.*, 1993).

Based on the mentioned theoretical justifications and on findings from past studies previously presented in this paper, the following propositions are postulated:

- P1** A positive relationship exists between site communality and trust.
- P2** A positive relationship exists between site communality and web site satisfaction.
- P3** A positive relationship exists between site communality and customer loyalty.
- P4** A positive relationship exists between trust and web site satisfaction.
- P5** A positive relationship exists between trust and customer loyalty.
- P6** A positive relationship exists between web site satisfaction and customer loyalty.

Importantly, testing this model will also address the nomological validity of our site-communality measure. Nomological validity entails examining a complex web of causal relationships between constructs and evaluating whether a new construct behaves in the way envisioned by the researcher (i.e. significant paths, positive versus negative paths – see Boudreau *et al.*, 2001).

Another limitation is that we did not conduct any individual data analysis for each of the three industry categories considered in this study (i.e. banking, pharmacies, insurance). Sample sizes would have been too small for confirmatory factor analysis using LISREL (a minimum of $n = 200$ is typically recommended). Indeed, a comparative analysis across industries may reveal different trends. In a recent study, Mithas *et al.* (2007) show that the effects of web site content and functionality on customer loyalty vary depending on business domain. It is quite plausible that, similarly, site communality is more beneficial in certain online industries and less so in others.

Future research will also need to identify what type of web site content most effectively elicits strong perceptions of site communality in visitors. For instance, the addition of third-party endorsements (e.g. TRUSTe) are considered to be trust enhancers in the area of Web-retailing. McKnight *et al.* (2002) speculated that the addition of such seals may have a positive impact on benevolence. Given that site communality and benevolence are related concepts, the effects of these seals on customer perceptions of site communality are worth exploring. Studies may also want to look at the effectiveness of images (e.g. a smiling employee) in creating communal expectations in visitors. Images which convey caring and positive emotions are likely to require much less cognitive elaboration from visitors of the web site and can be processed more quickly than, say, lengthy textual descriptions. Past empirical findings on non-verbal cues such as facial expression, direction of gaze and even a person's gender may also be of help for this area of research. For instance, studies reveal that greater eye contact is associated with friendliness while little eye contact is more often a characteristic of indifference (e.g. Kleck & Nuessle, 1968). Social psychologists have also found that the female gender is more often associated with nurturance and caring (VanYperen *et al.*, 1992). These findings may prove helpful in identifying if certain images are more effective in increasing customer perceptions of site communality. Such future studies may even aid in the design of

anthropomorphic agents (see Qiu & Benbasat, 2005) so as to more effectively mimic emotions and behaviours more closely associated with communal relationships.

Furthermore, given that site communality will elicit customers' expectations that the company will behave according to communal norms, what are the consequences of not meeting such expectations? Violating the norms associated with communal relationships (e.g. friends or family unwilling to help us during times of need) can lead to feelings of betrayal. Expectancy violation theory (Burgoon, 1993) may be helpful in exploring the potentially negative consequences for companies that do not deliver on their promise of communality.

Finally, additional research is needed to understand whether web sites high in site communality are more effective in attracting particular types of users. Factors worth looking into include computer self-efficacy (Compeau & Higgins, 1995). Low self-efficacy may lead many consumers to shun away from using the internet to conduct business transactions. Web sites perceived as high in site communality may help alleviate these customers' fears by conveying a sense that company assistance is readily and easily available when needed. Also, the work by Harris *et al.* (2000) hints at the existence of particular segments of consumers which may be more prone toward using web sites high in site communality (i.e. 'Friendship-seekers' are consumers who actively seek out communality). Similar findings have been reported in social psychology. People vary in their propensity to enter into communal relationships with others (i.e. Clark *et al.*, 1987). This is considered to be a stable orientation linked to a combination of several factors including personality and demographic variables (i.e. extraversion, need for nurturance, age).

CONTRIBUTIONS AND CONCLUSION

Researchers such as Loiacono *et al.* (2002) have explicitly recognized the utilitarian tendencies in web site design research and practice. Others have indirectly acknowledged this by turning their attention to investigating factors such as aesthetics and the hedonic value of web sites (e.g. Chung & Tan, 2004). To our knowledge, our study is among a very few to have explored whether relationship theories can guide commercial web site design. We developed a multidimensional scale for site communality using cross-sectional data collected from two questionnaires. During validation procedures, we found that site communality is positively related to the benevolence dimension of trust. Based on this result and on research findings from traditional commercial environments which evidence that communality impacts positively on customer loyalty, we proposed a future research model to investigate the influence of site communality on online trust, web site satisfaction and customer loyalty. Finally, we addressed the shortcomings of our study and suggested potential research routes for future studies into site communality.

In general, we hope this paper stimulates further empirical investigations into other relationship concepts which may be applied to web site design. This area of research remains largely unexplored. Our literature review identified only one other study which has shown the benefits

Table 3. Shortcomings on dimensions of site communality and possible actions

	Recommendation
Good cheer	Add content conveying positive emotions to visitors.
Role-spanning	Add content affirming/validating what visitors' care about outside of business (e.g. images which evoke the importance of family).
Approachability	Include company contact information on all pages, live help features allowing customers to easily contact service personnel online
Demonstration of caring	Use images or text messages to communicate empathy and understanding.
Self-disclosure	Add content revealing the company's concern and involvement in areas unrelated to its core business activity (e.g. involvement in good causes).
Authenticity/genuineness	Include third-party consumer reports and endorsement seals such as TRUSTe, customer comments and reviews.

of applying concepts derived from relationship theories to improve web sites (see Chen *et al.*, 2007). This leaves future investigators with vast opportunities to make important contributions to the area.

For online companies, the development of a multidimensional site-communality measure offers an important benefit when compared to overall measures; better diagnosticity (Nygren, 1991). Our multidimensional measure of site communality will enable companies to identify/address specific areas of concern on their web sites. For example, a company using our instrument could discover that its web site is lacking on the dimensions of approachability and good cheer. Carefully selected text and images could then be added to the web site to stress these specific aspects. Table 3 provides some recommendations for shortcomings across the individual dimensions of site communality.

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APPENDIX 1

Good cheer	
This web site makes me feel welcome.	*
This web site shows warmth for its customers.	†
This web site shows this company wants to convey good feelings toward visitors.	GC1
This web site shows friendliness toward customers.	†
This web site indicates that this company is keen on expressing good cheer toward visitors.	GC2
This web site conveys positive feelings on the part of the company toward visitors.	GC3
This web site was designed so as to convey positive feelings to customers.	GC4
Approachability	
The design of this web site makes me feel comfortable about having to contact this company.	†
This web site encourages users to seek assistance when needed.	AP1
This web site makes it easy for users to turn to this company for help.	AP2‡
This web site wants users to ask for help when they need it.	AP3
This web site suggests that I will not get frustrated or angry if I seek this company's assistance.	†
This web site suggests that this company expects customers to contact the company only as a last resort (reverse coded).	*
This web site invites users to get in touch with the company whenever they need to.	AP4
Demonstration of caring	
This web site wants me to know that the company behaves in a caring manner with customer.	C1
This web site shows this company nurtures its customers.	C2
This web site suggests customers are well looked after.	C3
This web site shows this company tries to be close to its customers.	*
This web site shows this company is thoughtful of customers.	†
This web site tries to convey a strong sense of caring for the customer.	C4
Authenticity/genuineness	
This web site makes me believe that this company has a <i>genuine</i> concern for its customers.	AU1
This web site has persuaded me that this company has <i>real</i> feelings for its customers.	AU2
I got a sense of <i>heartfelt kindness</i> toward customers when I was on this company's web site.	*
This web site has convinced me that this company <i>honestly</i> wants to help customers, not just sell them something.	AU3
After visiting this site, I suspect that this company <i>only helps people when doing so is good for business</i> (reverse coded).	†
Based on its web site, my impression of this company is that it is <i>primarily guided by profit</i> (reverse coded).	†
After seeing its web site, I feel that this company would help a customer <i>only to get something in return</i> (reverse coded).	†
Role spanning	
This web site reminded me of people, places, or things I care about.	RS1
This web site reminds visitors of other important things in life aside from business.	RS2‡
This web site contains pictures or information which I related to on a deeper, human level.	RS3
This web site tells me this company sees visitors 'as people', not only 'as customers'.	RS4
This web site shows that this company's interest in me does not go further than my business (reverse coded).	†
This web site shows this company tries to relate to visitors on a personal as well as on a commercial level.	RS5
Self-disclosure	
After having visited this web site, I feel like I know whom I am dealing with, not just what they are selling.	†
This web site provides more than simply business information about this company.	SD1
This web site reveals interesting facts about this company not directly related to its business.	SD2
This web site shows that this company feels that it's important to tell visitors about itself.	SD3‡
This web site contains more than just information about this company's business activities.	SD4

*Dropped in Card Sorting.

†Dropped in Exploratory Factor Analysis (EFA).

‡Dropped in Confirmatory Factor Analysis (CFA).

APPENDIX 2

Web sites	Questionnaire 1 (<i>n</i> ₁ = 249)	Questionnaire 2 (<i>n</i> ₂ = 305)
Canadian Imperial Bank of Commerce (www.cibc.com)	14 (5.6%)	20 (6.6%)
Colonial Savings Bank (www.colonialsavings.com)	17 (6.8%)	8 (2.6%)
IMB (www.imb.com.au)	11 (4.4%)	12 (3.9%)
Laurentian Bank (www.laurentianbank.com)	7 (2.8%)	5 (1.6%)
Macquarie Bank (www.macquarie.com.au)	13 (5.2%)	4 (1.3%)
Manchester Unity Credit Union (www.manchesterunity.org.nz)	7 (2.8%)	15 (4.9%)
Scotia Bank (www.scotiabank.com)	18 (7.2%)	18 (5.9%)
WestPac Bank (olb.westpac.com.au)	8 (3.2%)	11 (3.6%)
First Metro Bank (www.firstmetro.com/personal_banking.html)		5 (1.6%)
County Bank (www.countybank.com/40personal.htm)		1 (0.3%)
Citizens Bank of Canada (www.citizensbank.ca/Personal/)		10 (3.3%)
Banking total	95 (38.2%)	109 (35.7%)
1Drugstore-Online (www.1drugstore-online.com)	29 (11.6%)	22 (7.2%)
Canadian Drugs (www.canadiandrugs.ca)	7 (2.8%)	23 (7.5%)
Canameds (www.canameds.com)	4 (1.6%)	17 (5.6%)
Man-Health Online Pharmacy (www.man-health.com)	16 (6.4%)	25 (8.2%)
Priority Pharmacy (www.prioritypharmacy.com)	24 (9.6%)	17 (5.6%)
WebPharmacy (www.Webpharmacyrx.com)	20 (8.0%)	25 (8.2%)
Pharmacy total	100 (40.2%)	129 (42.3%)
Aetna (www.aetna.com)	15 (6.0%)	8 (2.6%)
Alexander Insurance Incorporated (www.alexanderinsurance.com)	9 (3.6%)	7 (2.3%)
DuBose & Associates (www.duboseandassociates.com)	15 (6.0%)	12 (3.9%)
J. Weinberg & Associates (www.room100.com/insurance)	4 (1.6%)	2 (0.7%)
LEM Insurance Services (www.lemsvcs.com)	11 (4.4%)	2 (0.7%)
Royal and Sun Alliance (www.royalsunalliance.ca/royalsun/)		8 (2.6%)
RBC (www.rbcinsurance.ca)		9 (3.0%)
M.A.M.I (www.mamiusa.com)		2 (0.7%)
AMFAM (www.amfam.com)		1 (0.3%)
International Student Insurance (www.internationalstudentinsurance.com)		13 (4.3%)
Amica (www.amica.com)		3 (1.0%)
Insurance total	54 (21.7%)	67 (22%)

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