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MEASURING PERCEIVED POLITENESS IN VIRTUAL COMMERCIAL CONTEXTS WITH A MULTI-DIMENSIONAL INSTRUMENT

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ABSTRACT

Politeness pertains to business success, but relevant issues in virtual contexts obtained limited attention from both practitioners and researchers. This research work proposed a multidimensional structure for modelling politeness in virtual commercial contexts, and then developed an instrument for measuring perceived politeness in online commercial footholds accordingly. Furthermore, confirmatory factor analysis was applied to confirm the structural fitness of the second-order, 6-factor model, and investigate the reliability and construct validity of the factors and items in the measurement model. Besides its practical applications in virtual storefront administration, this research sets a stage for further related studies in the future.

Keywords: e-commerce, online storefront, politeness, measurement, confirmatory factor analysis.

INTRODUCTION

1.1 Politeness and its significance of in business

Politeness generally refers to legitimate and considerate interactions among persons, which serves as a foundation of modern civilization (Whitworth and De Moor 2003). It also is a key factor that upholds prosperous and peaceful societies (Fukuyama 1992). Particularly, politeness has a significant impact on commercial activities. In physical contexts, a business will forfeit its customers gradually if it cannot treat them politely; even it has other advantages such as convenience, competitive pricing, plentiful product choices, advanced facilities, etc. Actually, impoliteness in commercial contexts often hurts people's feelings and faces, thus will overshadow its other advantages and leave patrons negative impression and adverse words-of-mouth. Based on rationales and practical experiences, politeness in commercial contexts affects peoples' perceptions, satisfaction, and loyalty. In fact, prior research works (Matzler, Sauerwein, and Heischmidt 2003, Millán and Esteban 2004, Zineldin 2006) confirmed the influence of

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politeness on customer satisfaction, which is a key driver of customer loyalty (Fornell et al. 1996), sustainable revenue (Bolton 1998, Hallowell 1996), and successful business. Moreover, according to prior studies that developed instruments for measuring service quality in different business segments, politeness was one of key determinants of business' service quality (Parasuraman, Zeithaml, and Berry 1985, Nelson and Nelson 1995), which in turn has been proved as a significant determinant on customers' satisfaction (Sivadas and Baker-Prewitt 2000, Olorunniwo, Hsu, and Udo 2006) and loyalty including re-purchasing and referral behaviors (Seiler, Webb, and Whipple 2000). From the viewpoint of synergistic social interactions, Whitworth and Liu (2009) believed that politeness can increase trade volume; a non-zero-sum activities where all parties win.

Moreover, Berry (1995), Reynolds and Beatty (1999) also found that rapport that consists of enjoyable interactions and personal connections, is a major determinant influencing customers' satisfaction and loyalty, which lead to a successful business. Kim and Davis (2006) further asserted that politeness plays a key role in the early stage of establishing rapport between salesmen and customers. In summary, the above studies imply that merchants unlikely to build up a satisfying and loyal customer base if they do not pay attention to the politeness issues.

In contrast to its significance, the politeness issue has received relatively rare attention from both practitioners and researchers. One of few politeness-related theoretic works is the politeness theory, which was introduced by Penelope Brown and Stephen Levinson (1987) and has widely being used as a foundation for studying interpersonal politeness issues since its inception. Their theory focuses on how to use linguistic strategies to maintain hearers' faces in the course of verbal communication.

1.2 Politeness in Computing Environments

Prior study indicated that human expect polite interactions with computers reciprocally, just like they treat their computers with politeness (Nass 2004). The findings show that users care about the politeness of computers with which they interact. Another study revealed that the politeness shown by computers will make users behave reciprocally with more politeness (von der Pütten et al. 2009). Besides, a number of prior studies (Cooper 1999, Parasuraman and Miller 2004, Preece 2004, Skogan 2005) also confirmed the significant influence of politeness on human-computer interactions.

When the Internet and various forms of computers keep permeating into each aspect of our daily life, customers eventually are going to completely recognize the politeness issue in online storefronts, just like they are aware of politeness issues in physical commercial environments. Whitworth stated that impolite software, though function well, yet presents one kind of social error, which still likely to drive away users (2009). Most importantly, these patrons are prospective customers while they are strolling around merchants' online storefronts. In contrast to its physical counterparts, online storefronts interact with their customers via computer-generated contents and actions, which respond to customers' requests. Computer-human interactions include not only textual message exchange that is analogous to the verbal communication between persons, but also many aspects such as information architecture, look-and-feel of graphical user interface, responsiveness, ease of use, transparency, and many others (Guo 2014). The practical implication is that, besides factors including functionality, visual design, operating convenience, and performance, building a competitive online storefront also needs to take politeness into account. Obviously, in the age of computers and Internet, the politeness theory focusing on interpersonal verbal communications alone become inadequate to interpret, assess, and manage the politeness between human and computers. In light of this inadequacy, Brian Whitworth established a polite computing framework (2005), which took multi-facet viewpoints to examine cyberspace's politeness beyond conventional linguistic strategies. Based on users' perceptions, that framework applies five principles to judge whether computer-initiated actions in five different facets are polite or not. The combination of this framework and the prior linguistic-oriented politeness theory will be a comprehensive way for assessing the extent to which an online storefront treats its patrons with politeness. Consequently, the present work develops a politeness instrument based on this combination.

1.3 Motivation and research goals

In contrast to its significance, rare attention has been paid to the politeness issue, especially in online commercial contexts. Both prior studies and rationales told us politeness in storefronts is important and well worth consideration, but it is still vague about how to measure it, especially in online environments. In consequence, this research work aims to develop a measurement for gauging the perceived politeness in online storefronts through patrons' viewpoints. Besides, the reliability and validity of the measurement and its underlying model were investigated empirically.

2. Literature Review

Superficially speaking, the politeness is an abstract concept and thus hard to measure it directly. The politeness theory introduced by Penelope Brown and Stephen Levinson (1987) is one of few that built theoretic foundation for seriously investigating the interpersonal politeness issue. However, their theory gave a specific interpretation about politeness; it only focuses on linguistic strategies used in verbal communication among persons. In their opinions, politeness is the expression of speakers' intention to mitigate face threats caused by particular face threatening acts toward hearers. Besides, the theory stated that politeness consists of positive and negative parts; the positive part involves showing speaker's approval, solidarity, and understanding toward hearers, while the negative part deals with lessening potential imposition.

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Since its inception, the politeness theory has been questioned due to its confined perspective (Mao 1994, Locher and Watts 2005), but it still influenced several subsequent research works including those in the areas of human-computer interaction design (Pemberton 2011), business administration (Dunn 2011), and others.

Many people tried to measure the politeness focusing on verbal communications due to the necessity of embedding this concept into people's behavioral model. Hence, the conventional "politeness theory" has been operationalized to build measurement for gauging politeness in different physical contexts. Among others, Dawn Lerman (2006) built a scale for measuring politeness in order to examine the relationship between consumer politeness and their propensity to engage in various forms of complaining behavior. The 6 items in his scale were drawn from the politeness theory, 3 on positive and 3 on negative side. The 6 items collectively assess to which extent subjects are polite while they are expressing their thought and opinions verbally.

While computers are continuously influencing people's work, life, education, and many other activities, it is rational that people need to pay more attention to the politeness of computers with which they interact often. In fact, the impact of politeness on different facets of human-computer interactions has been investigated, but by relatively fewer researchers. After studying the effect of automation etiquette, which makes human participants be able to predict machine's behaviors and increase trust correspondingly, Miller (2005) found that good automation etiquette not only significantly enhanced diagnostic performance, but also was powerful enough to overcome low reliability in highly critically automation systems such as airplane cockpits. In a different domain, the study by Wang et al. (2008) indicated that a polite pedagogical agent that interact with learners generated better learning outcomes, comparing with a counterpart that use more direct approach to interact with learners.

To provide a basis for conducting politeness research in computerized contexts, Brian Whitworth and his colleagues introduced 5 principles (criteria) for judging software politeness, based on theories about sociology and socio-technical interactions (Whitworth and Ahmad 2013). The 5 principles are summarized as follows:

1. Respecting user's rights; polite software respects and thus will not preempt users' rights. In addition, polite software does not utilize a piece of information before obtaining the permission from its owner.

2. Behaving transparently; polite software does not change things secretly. In contrast, it clearly declares what it is doing or will do, the real purpose of the action, and who it represents.

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3. Providing useful information; polite software helps users make informed decisions by providing useful and comprehensible information, in contrast, they avoid providing information that distract or even mislead users.

4. Remembering users; polite software memorize its past interactions with a specific user, thus can bring that user's choices and preferences to future interactions.

5. Responding to users with fidelity; polite software must respond to users' requests faithfully rather than trying to pursue its own agenda.

This 5-principle definition is applicable to all forms of computer software with which users interact to perform particular tasks, such as standalone software, Web sites (i.e., Web-based applications), mobile APPs, software as a service (SaaS), etc. Based on this polite computing framework, Dwyer (2011) examined the behavioral targeting practices taken by many online advertisers and claimed that behavioral targeting is impolite, which undermines customers' trust in e-commerce contexts.

The politeness in online storefronts can be assessed by operationalizing the framework by Whitworth and the politeness theory. Nevertheless, there is no reported work that investigated how to apply them to assess politeness quantitatively yet, not to mention reported measurement for gauging the politeness in online storefronts, where computer-initiated contents and actions affect users' feelings and perceptions.

2.1 Methodology

To operationalize the polite computing framework presented by Whitworth (2013) and the politeness theory collectively, the present work built a conceptual model with 6 latent factors, 5 of them correspond to the 5 principles in polite computing framework, and 1 factor corresponds to the politeness theory. Then, 24 observable survey items were drawn, and load on the 6 latent factors evenly. Later, the reliabilities of the measurement and its 6 factors were examined. Then, goodness-of-fit of three alternative models were checked, the most appropriate model was selected accordingly, followed by examining the reliability, construct validity, and factor structure of the model with best fitness.

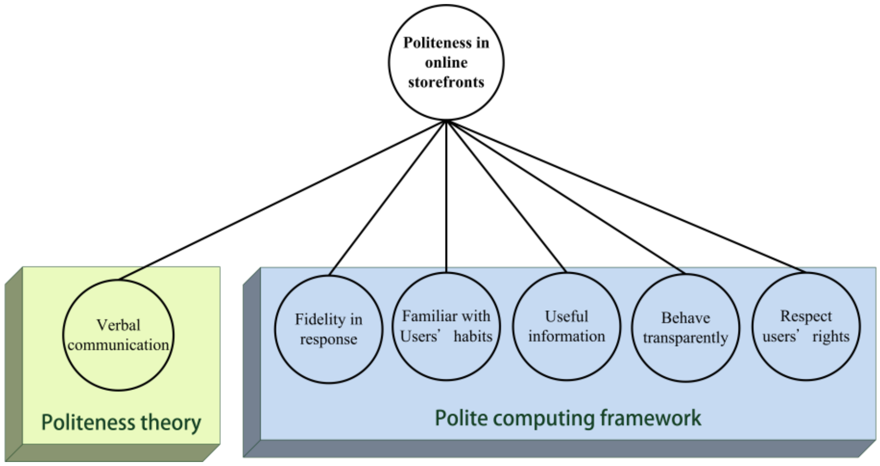

Figure. 1 A hierarchical, multidimensional structure for modelling politeness

2.2 Conceptual model and measurement development

As figure 1 shows, a multidimensional model was built based on 2 major theoretic works associated with politeness, one is the 5-principle polite computing framework focusing on the politeness in computer-human interactions, another is politeness theory focusing on the linguistic strategies in interpersonal verbal communication. A group of 20 college and graduate students with at least 5 years of online shopping experience were recruited first. After providing them a brief introduction to the model as well as its underlying theories, and then 4-week of acquaintance with 5 selected travel agents' online storefronts with 3 major product lines: airline tickets, hotel rooms, and travel packages, students were invited to draw observable action items, which they thought were able to assess to what extent a visited online storefronts conforming to the 6 factors of the conceptual model. Then, a focus group comprising 5 faculty members with expertise in information management or business administration concluded total 24 questionnaire items; 4 items are associated with each factor in the model. Each item was re-assured be able to judge to what extent an online storefront treats patrons politely according to one particular principle in the polite computing framework or the politeness theory. Since the students could not precisely comprehend or express the positive and negative face-threatening acts in the politeness theory, the final 4 survey questions in the verbal communication (VC) factor were re-stated by faculty members; 2 are associated with positive politeness, while another 2 are associated with negative politeness. A pre-test of the questionnaire was performed by 10 students majored in information management, wording adjustment was made subsequently to make the

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survey questions more precisely express what it intended to express. Through this process, both face and content validity of the measurement were confirmed.

Each survey item was assessed by a 7-point Likert scale, with higher scores representing the high end of the politeness scale; i.e., 1 indicates "strongly be dissatisfy with" and 7 means "strongly be satisfy with" a particular item. The survey is called POliteness in InterNet storefronts of Travel Agents (POINTA) measurement in this article. Table I summarizes the 24 items in the measurement.

Table 1 Descriptions of Items in the POINTA Measurement

factor (latent variables)	observed variables	descriptions
Respect Right of Users	RR1	online storefronts play video or animation slowing down my browser but is hard-to-stoppable
	RR2	online storefronts display disturbing but irrelevant messages from time to time
	RR3	online storefronts exploit membership information to send SPAM advertisement
	RR4	online storefronts change the default setting of my browser, such as homepage
Behave Transparently	BT1	online storefronts added members into other mail-list, online communities/groups without notification before doing so
	BT2	online storefronts disclose surcharges for changing or cancelling a booking in a clear way
	BT3	online storefronts tag a product with a price lower than that would be actually charged later, but did not clearly state the lower-priced items have other restrictions
	BT4	online storefronts often added "…subject to change" phrase in detailed descriptions of products so that patrons are forced to make decisions based on incomplete information

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Useful Information	UI1	online storefronts provide well-organized catalogues and/or search engines, so patrons can find particular products with ease
	UI2	online storefronts provide adequate ground transportation information of destined cities
	UI3	online storefronts provide links directly pointing to the official homepages of airlines, hotels from where patrons can collect more reliable details
	UI4	online storefronts provide adequate information about my booked hotel's surrendering areas
Familiar With Habits	FH1	online storefronts record my profile and use it in appropriate contexts so that I do not need to re-enter the same data
	FH2	online storefronts record my preferred choices (airlines, seat, date/time, etc.) that can quickly screen the fittest one out of many available options
	FH3	online storefronts keep track of my repeated and periodical booking patterns and remind me accordingly
	FH4	online storefronts record my membership data of different frequent traveller programs thus I do not need to re-enter them
Fidelity in Response	FR1	online storefronts place another 3rd party's advertisements within the item under review
	FR2	online storefronts report the status of my order right after booking, thus my travel plan could be confirmed without any uncertainty
	FR3	online storefronts return an item that do not meet my specified criteria without explaining the reason (such as "your choice is not available")

	FR4	online storefronts' clerks do not promptly respond to my inquiries in email
Verbal communication	VC1	online storefronts fail to fulfil my requests but respond with direct wording, such as "there is no available seat on the specified time…"
	VC2	online storefronts show messages that look like criticism of something I did, such as "there is no outbound flight on the date you chose…."
	VC3	online storefronts provide alternative suggestions while I could not find a specific product
	VC4	online storefronts send emails reminding me my booked trips

2.3 Participants and procedure

An online questionnaire was used to collect participants' opinions. Before answering the questionnaire, a short instruction was provided to guide the participants to assess online storefronts in terms of their perceived politeness. After the orientation, 436 participants filled the online survey in the fall of 2014, and 329 completed the survey effectively. 177 (53.8%) of them are male, while 152 (46.2%) are female. This effective sample size is adequate for the subsequent confirmatory factor analysis according to Kim (2005) who suggested that number of participants should be 5 to 10 times of the total questionnaire items (24 in this study).

3.0 Data Analysis

3.1 Reliability of the measurement

The Cronbach`s α values measure the internal consistency of the 6 latent factors and the measurement. As Table 2 shows, the Cronbach`s α values of all factors exceeds Nunnally and Bernstein's (1994) recommendation of 0.70, thus support the application of the 6 factors and their corresponding items in this measurement. In addition, the Cronbach`s α value of the overall measurement is 0.9, which indicates that the POINTA measurement has a good internal consistency.

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Table II. Reliability checking of the POINTA measurement (*N*=329)

Latent factor	Observed variable	mean	SSD	Cronbach's α without	Cronbach's α
RR	RR1	5.41	0.98	0.779	0.828
	RR2	5.58	0.92	0.760	
	RR3	5.53	1.04	0.800	
	RR4	5.77	0.95	0.794	
BT	BT1	5.26	1.05	0.882*	0.874
	BT2	5.21	1.03	0.803	
	BT3	5.22	1.00	0.822	
	BT4	4.97	1.07	0.841	
UI	UI1	4.59	1.02	0.767	0.816
	UI2	5.00	1.05	0.778	
	UI3	4.57	1.09	0.732	
	UI4	4.81	1.08	0.796	
FH	FH1	5.12	1.03	0.891	0.915
	FH2	5.06	1.07	0.887	
	FH3	5.09	1.05	0.881	
	FH4	5.20	1.01	0.900	
FR	FR1	4.88	1.09	0.836	0.881
	FR2	4.92	1.10	0.815	

	FR3	4.79	1.14	0.826	
	FR4	5.26	1.04	0.902*	
VC	VC1	5.50	1.09	0.851	0.882
	VC2	5.26	1.08	0.842	
	VC3	5.39	1.11	0.829	
	VC4	5.30	1.16	0.874	

*Obtaining higher construct reliability after deleting it

3.2 Item Adjustment

To check whether the 24-item measurement could be improved further, confirmatory factor analysis (CFA) was used to examine fitness of the alternative models. Because the models were derived based on the prior theoretic works, CFA was a preferable method for comparing the fitness of different models to the collected data. As Table 3 shows, comparing with its 24-item counterpart, the 23-item model has better goodness-of-fit according to the fitness indices collectively. The removed item, FR4 has the factor loading (λ = 0.64) that is the minimal among all items' factor loadings. Besides, its deduction improved the reliability of its loaded factor: FR (Fidelity in Response), from 0.881 to 0.902. After removing another item with the lowest factor loading among the remaining items, BT1 (λ = 0.65), major goodness-of-fit indices improved further: RMSEA from 0.059 to 0.057 and GFI from 0.89 to 0.90. In addition, its deduction improved the reliability of its loaded factor: BT (Behave Transparently), from 0.874 to 0.882. Further item deduction could not improve the model's goodness-of-fit, so the 22-item (without BT1 and FR4) model was used as the basis for subsequent analysis.

Table 3 goodness-of-fit of 3 alternative models (*N*=329)

model	$\chi2$	$\chi2$/df	RMSEA	CFI	GFI	AGFI	SRMR	NFI	PGFI	PNFI

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		< 3	< 0.08	≧0.9	≧0.8	≧0.8	≦0.05	≧0.9	≧0.5	≧0.5
First-order, 24-item	515.45	2.174895	0.06	0.97	0.88	0.85	0.05	0.95	0.7	0.82
First-order, 23-item (deleting FR4)	458.55	2.132791	0.059	0.97	0.89	0.86	0.042	0.95	0.69	0.81
First-order, 22-item (deleting BT1 & FR4)	404.11	2.083041	0.057	0.97	0.90	0.87	0.039	0.95	0.69	0.80

3.3 Model selection

According to the polite computing theoretical framework and the approach for checking plausible alternative models presented by Doll and Torkzadeh (1988), the present study compared 4 different models' fitness to the sampled data. As figure 1 shows, the 4 examined models are (A) the first-order, 1-factor; (B) the first-order, 6-factor uncorrelated model; (C) first-order, 6-factor correlated model; and (D) second-order 1-factor, first-order 6-factor model. The ability of a model to fit participants' responses to the 22 items was judged by the values of each model's goodness-of-fit indexes. This research used the LISREL 8.8 to build the 4 models of interest and test the fitness of each model against the sample data. According to the models' goodness-of-fit index values that are summarized in Table 4, the model A obviously is not an acceptable candidate since none of its goodness-of-fit index values meet the recommended cut-off values. The model C is much better than its uncorrelated counterpart, the model B, and has adequate goodness-of-fit index values. Among other fit indexes, the RMSEA and SMRM values of the model D are 0.065 and 0.068, respectively; both are marginally larger than the model C's, but still below the cut-off values of 0.08, recommended Wang & Wang (2012). Basically, Model D and C generated close and both good model-data fits according to values of their relative and absolute fit indices (Kline 2011).

Furthermore, in order to measure the ability of the second-order factor (politeness) to explain the covariation among the 6 first-order factors, target coefficient (Marsh and Hocevar 1985), which is equal to the ratio of the chi-square of model C to the chi-square of model D, was 0.8412, an obvious indication of the second-order factor (politeness) can explain the covariation among the 6 first-order factors; in other words, the target coefficient value provided strong evidence of the second-order politeness factor in model D can explain 84.12 percent of the variation in the 6 first-order factors in model C.

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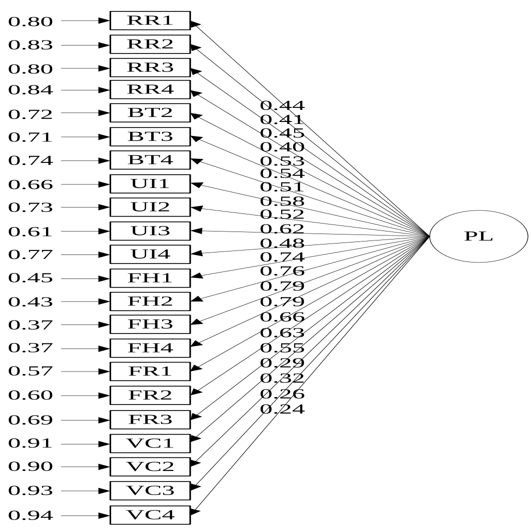
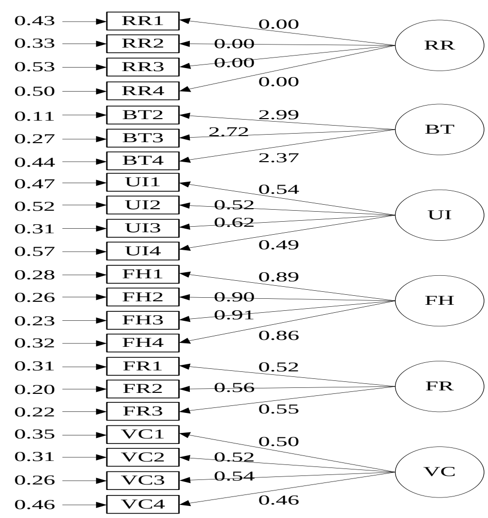
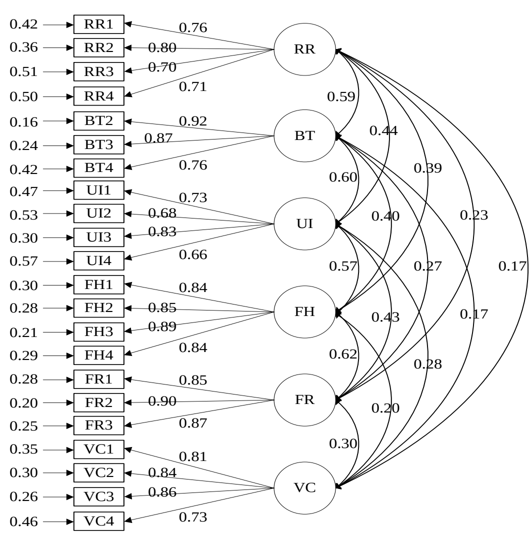
Prior studies suggest the existence of a single politeness construct; data analysis shows that the politeness construct in model D can explain the covariation among the 6 first-order factors, besides, model D can provide estimates of these factors' validity and reliability. Based on these reasons, the model D was used in the subsequent works analyzing the corresponding measurement model and structural model.



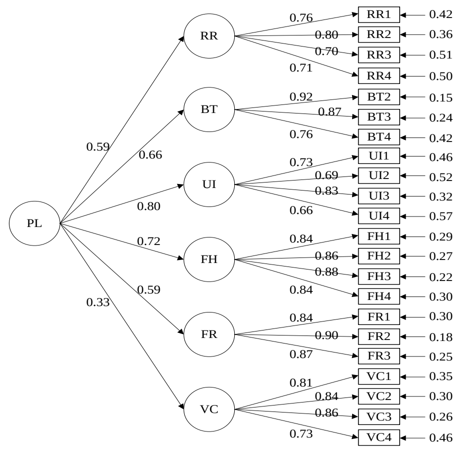


Model A

Model B



Model C



Model D

Figure. 2 four alternative models with factor loadings and structural coefficients

Table 4. Goodness-of-fit indexes in alternative models (*N*=329)

model	χ2	χ2/df	RMSEA	CFI	GFI	AGFI	SRMR	NFI
Suggested cut-off		< 3	< 0.08	≧0.9	≧0.8	≧0.8	≦0.08	≧0.9
(A) 1st-order, 1-factor	3482.46	16.66	0.219	0.72	0.51	0.41	0.15	0.7
(B) 1st-order, 6-factor, uncorrelated	1013.39	4.85	0.108	0.92	0.78	0.73	0.24	0.9
(C) 1st-order, 6-factor, correlated	404.11	2.08	0.057	0.97	0.90	0.87	0.039	0.95
(D) 2nd-order, 6-factor	480.41	2.37	0.065	0.97	0.88	0.85	0.068	0.94

3.4 Measurement model analysis

Reliability and convergent validity

According to the suggestions of Bagozzi and Yi (1988), this work applied maximum likelihood estimation to test the measurement model. The criteria include factor loadings and indicator reliabilities, i.e., square multiple correlation (SMC) of the 22 observed items, composite reliabilities (CR) and variance extracted (VE) of the 6 first-order factors, as Table 5 summarizes. Factor loadings above 0.32 represent substantial coefficient and structural equivalence (Tabachnick and Fidell 2008), so all items in the POINTA measurement were considered meaningful and retained for their loaded factor. The SMC values indicated that the reliabilities of individual observed items are higher or very close to the recommended level of 0.5 (Bagozzi and Yi 1988), except the UI4 item. Composite reliabilities and variance extracted measure the reliability and convergent validity of each factor, respectively. All factors' CR and VE values exceeded the recommended cut-off values of CR and VE (Fornell and Larcker 1981): 0.7 and 0.5, respectively. Overall speaking, the analysis results showed the measurement model has good reliability and convergent validity.

Table 5 Measurement model fit indices for convergent validity (*N*=329)

Variable	Standardized loading	Measure error	Indicator reliability (SMC)	Composite reliability (CR)	Variance extracted (VE)
RR1	0.76	0.42	0.58	0.83	0.55
RR2	0.80	0.36	0.64		
RR3	0.70	0.51	0.49		
RR4	0.71	0.50	0.50		
BT2	0.92	0.15	0.85	0.89	0.73
BT3	0.87	0.24	0.76		
BT4	0.76	0.42	0.58		

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UI1	0.73	0.46	0.53	0.82	0.52
UI2	0.69	0.52	0.48		
UI3	0.83	0.32	0.69		
UI4	0.66	0.57	0.44		
FH1	0.84	0.29	0.71	0.92	0.73
FH2	0.86	0.27	0.74		
FH3	0.88	0.22	0.77		
FH4	0.84	0.30	0.71		
FR1	0.84	0.30	0.71	0.90	0.76
FR2	0.90	0.18	0.81		
FR3	0.87	0.25	0.76		
VC1	0.81	0.35	0.66	0.88	0.66
VC2	0.84	0.30	0.71		
VC3	0.86	0.26	0.74		
VC4	0.73	0.46	0.53		

Discriminate validity

As Table 6 shows, square root of the average variance extracted (AVE) of each factor was larger than all other inter-factor correlations, and exceeds the recommended cut-off level of 0.7 (Fornell and Larcker 1981). So, the discriminant validity of the 6 latent factors in the measurement model was confirmed. Taking both convergent and discriminant parts into account, construct validity of the measurement model was confirmed.

Table 6 Inter-construct correlations matrix

factor	RR	BT	UI	FH	FR	VC
RR	0.743*					
BT	0.408	0.854*				
UI	0.340	0.511	0.722*			
FH	0.291	0.315	0.423	0.855*		
FR	0.182	0.237	0.361	0.544	0.870*	
VC	0.142	0.130	0.207	0.171	0.259	0.811*

*: the square root of VE

3.5 Structural model analysis

As shown in Table 7, absolute, parsimonious, and relative goodness-of-fit indexes' values collectively confirmed that the model with 6 first-order factors loading on a second-order politeness factor has a pretty good fit to the sampled data, which mean the proposed conceptual model can meaningfully represent the POINTA measurement's underlying structure, and the politeness is a single second-order construct comprising 6 subscales.

Table 7 Goodness-of-Fit Measurements

Goodness-of-Fit Measure	Level of Acceptable fit	Model Result
Chi-square		480.41(P=0.0)
df		230
Chi-square/df	<3	2.37
RMSEA	<0.08	0.065

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Absolute fit indices	GFI	>0.8	0.88
	AGFI	>0.8	0.85
	SRMR	<0.08	0.068
Parsimonious fit indices	PNFI	>0.5	0.83
	PGFI	>0.5	0.71
Relative fit indices	NFI	>0.9	0.94
	NNFI	>0.9	0.96
	CFI	>0.9	0.97
	IFI	>0.9	0.97
	RFI	>0.9	0.94

3.6 Discussion and Implications

According to the statistics in Table 2, among the 6 factors, "respect users' rights (RR)" and "verbal communications (VC)" received higher grades from subjects, comparing with other 4 factors. In contrast, "providing useful information (UI)" and "Fidelity in response (FR)" are the two with relatively inferior assessment in the politeness measurement. Especially the UI factor, combining with its high loading (λ = 0.80, the highest among all factors) on the second-order politeness factor, online merchant should make proportional efforts to improve their capabilities of offering patrons useful information, in order to gain better overall politeness assessment. Taking a closer look at the survey items in the UI factor, online travel agents should provide patrons more comprehensive travel and transportation information as parts of their post-sell services, rather than focusing on selling their products and the corresponding advertisements.

The second-order confirmatory factor analysis revealed that patrons' overall politeness perceptions cab better predict their responses to the factor of "providing useful information (UI)" (λ = 0.80) and the factor of "familiar with users' habits (FH)" (λ = 0.72), while they are assessing the overall politeness in online storefronts. In contrast, the politeness construct marginally predict their responses to the factor of "verbal communication (VC)". Heavier loading of the UI and FH factors on the politeness reminds travel agents owning online storefronts that time efficiency is critical to many patrons since they need to go through a long process comprising a number of steps before making necessary purchases. In consequence, patrons dislike receiving any useless or distracting information that waste their time, which is consistent with the prior study (Sorce, Perotti, and Widrick 2005) that proved informativeness motive conducting business online. On the other side, online storefronts that can remember patrons' profiles and frequent traveler's membership information can help patrons in reducing the time spent on filling redundant data.

In general, shoppers are price-sensitive (Han, Gupta, and Lehmann 2002, Teng 2009, Biswas et al. 2002), especially while they are purchasing high-priced items such as computers and travel packages (Chen and Hu 2012). That kind of sensitivity rationalizes subjects' concerns about transparency (of pricing rules, surcharges for changing or cancelling, and so on) in online travel agents (λ = 0.66), while they are assessing agents' politeness. Obviously, crystal and correct product information is critical to patrons who need to plan a trip and execute it within budget limit.

The most surprising result is that the deviation of the "verbal communication (VC)" factor from the politeness construct (λ = 0.33), which informed 33 percent of the variance in the VC factor was accounted for by the second-order politeness construct, in other words, the subjects' overall politeness perceptions cannot moderately explain their responses to the textual messages shown by the examined online travel agents. A rational explanation is that the reliability and validity analysis support the composite politeness scale can be used to assess the overall politeness performance in online storefronts; however, the corresponding deviation suggests a single politeness score had better be used in conjunction with scores from individual factors, which can provide insight into the politeness issues.

4.0 Conclusions

4.1 Contributions and limitations

Both rational inference drawn from practical experiences and academic studies supported that various forms of impoliteness in storefronts will be harmful to merchants. Consequently, politeness management is important to merchants owning online storefronts in the age of electronic commerce. This work built and validated a 2-order, multidimensional measurement for gauging the degree of politeness in online storefronts, the examined subjects are online travel agents. After developing the new measurement, this study confirmed the psychometric properties of the measurement and its underlying model with a sample of 329 subjects. Among other properties, the fitness of the factor structure was confirmed through testing a hierarchical model with 6 first-order factors loading on a second-order politeness construct by using confirmatory factor analysis.

The research findings indicate that subjects tend to perceive the selected online travel agents manage politeness in their online storefronts acceptably, but there is still a substantial room for improvement, particular in providing useful information and responding with fidelity. Besides, the factor structure and loadings suggest that a single score could be used to measure the overall degree of politeness in online commercial contexts.

Regarding the limitation of this research, because many aspects including subjects' society class, education, occupation, income, prior online shopping experience, and others collectively shape subjects' feelings, perceptions, and preferences. Therefore, further research works with diversity in subjects' aspects are necessary to generalize a commonly acceptable measurement; and meta-analytic structural equation modeling (Cheung and Chan 2005) is applicable to generalize the findings of related works.

4.2 Future directions

Despite its infancy making many further works are necessary to refine the techniques for measuring politeness in various virtual contexts, this work lays the foundation for future research on three major directions; one is politeness measurement issues in various virtual contexts, such as e-learning, e-healthcare, e-government, and all others that need intensive interactions between patrons (human) and web-based storefronts (computers). Another direction worth investigation is cross-country, cross-gender, or cross-industry comparisons, for example, analyzing perceptions toward politeness of the same e-tailer based on patrons from regions with different cultures or religions, which likely to interest those politeness-aware merchants targeting global customers. The last direction is studying the influence of politeness on other constructs in online contexts. These constructs might include but not limit to rapport, perceived service quality, perceived value, perceived use of use, trust, customer loyalty, business performance metrics such as revenue, and others that interest administrators or decision makers.

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