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ABSTRACT

This study contributes to the mobile commerce literature by investigating the moderating roles of demographic variables, namely age, income, and gender, in forming perceptions and behavioral outcomes with regards to mobile phone services. To this end, hypotheses and research questions are developed and structural equation modeling techniques are applied to a dataset of 1,253 mobile phone users in the U.S. Using this data, the relationships between antecedents of satisfaction with mobile services, user satisfaction with those services, and its outcomes, are examined in different demographic groups. Based on this comparative analysis, several observations that advance our understanding of user interaction with mobile services are made, and a number of strategic recommendations for mobile service providers are outlined. Overall, it is believed that a convergence of marketing and management information systems theories, combined with a practical yet scientific approach to the investigating of important issues in mobile commerce, may potentially contribute to both theory and practice.

Keywords (Required)

Mobile commerce, customer satisfaction, loyalty, American Customer Satisfaction Model, moderation, age, income, gender.

INTRODUCTION

In today's economy, most managers realize that organizational performance objectives can only materialize through high levels of customer satisfaction (Fornell, 2001). As demonstrated by the growing body of academic and practitioner-oriented literature, for most products and services, customer satisfaction has a strong positive effect on critical success factors, such as customer loyalty and the likelihood of product or service repurchase (Anderson and Fornell, 2000). As such, all-purpose customer satisfaction measures and indices (i.e., "barometers") were developed (e.g., Fornell, 1992). The extant literature also provides a number of antecedents and consequences of customer satisfaction that are presented within several nomological networks. Among these widely used measures and models, the American Customer Satisfaction Model (ACSM) (Fornell, Johnson, Anderson, Cha and Bryant, 1996) has drawn the attention of the research community. The advantage of using this model is two-fold. First, it offers several key antecedents and consequences of customer satisfaction. It is vital for both researchers and practitioners to know what factors affect satisfaction, and what effect satisfaction has on other constructs that are directly linked to the overall organizational performance. Second, the ACSM is robust, and it may be successfully adapted to various products and services, including information technologies (Dow, Serenko, Turel and Wong, 2006), and mobile services (Turel and Serenko, 2006).

Satisfaction with mobile services is an important investigation area since satisfaction may affect service adoption and use. As mobile IT services become more widespread, the significance of customer satisfaction, loyalty, and retention becomes vital to the financial performance of the industry (Lin and Wang, 2005). Wireless services, despite their short time-span of existence, have had a phenomenal growth. By March 2005, there had been 1.6 billion subscribers (Shim, 2005). At the same time, the mobile phone industry has been lagging behind most other sectors in terms of customer satisfaction. Particularly, in recent years, there has been a noticeable decline in the level of US consumers' satisfaction with mobile services (Fornell, 2005).

Given the abovementioned potential implications of user satisfaction with these services, there is a need to further understand the nomological network of the user satisfaction concept in the context of mobile phone services.

To date, several attempts to understand user perceptions and satisfaction with mobile services have been undertaken. For example, the ACSM with regards to mobile IT services was tested and validated (Turel and Serenko, 2006). On the one hand, these projects offer valuable information for both academics and wireless phone service providers. On the other hand, all previous studies report on the usage of the ACSM in the aggregate form, and investigations of possible moderating effects of consumer demographics on the ACSM relationships are noticeably lacking. Understanding roles of key moderators is vital for both scholars and managers. For researchers, understanding impacts of salient moderators may reveal new phenomena and improve the predictive validity of research models (Sun and Zhang, 2006). For managers, it may have some policy implications; for instance, they can adjust their customer services to meet the attributes of specific groups. Based on this information, managers and marketers of wireless technologies may make better strategic decisions in terms of budget allocations, promotions, and customer service strategies.

In order to address the abovementioned needs and gaps, this project reports on confirmatory and exploratory investigations, using a dataset of 1,253 wireless subscribers in the U.S. First, a confirmatory analysis was applied to the adaptation of the ACSM. Second, an exploratory investigation of the moderating roles of demographic variables in forming perceptions and behavioral outcomes of satisfaction with regards to mobile phone services was conducted. Specifically, age, income, and gender were chosen for the latter analysis because they have been shown to affect the links among constructs of various models within the Management Information Systems (e.g.,Venkatesh, Morris, Davis and Davis, 2003) and marketing (e.g., Roslow, Li and Nicholls, 2000) contexts. As such, this study builds on the convergence of marketing and management information system disciplines (i.e., it employs a model developed in the domain of marketing and applies it to an information technology services). This convergence is needed since mobile IT services go beyond the traditional, free-of-charge, organizational IT. Individuals may pay for each and every use of these services, utilize them for hedonic or utilitarian purposes, and within a wider range of contexts (Turel, Serenko and Bontis, 2005). Overall, it is believed that the adaptation of the ACSM to study mobile phone services, combined with the usage of several important moderators, may reveal new phenomena related to user perceptions and behavioral outcomes of satisfaction with mobile services.

To describe this study and present the contributions, the paper has three sections. First, theoretical background of the research model and the selected moderators is offered. Second, the analysis and results are presented. Finally, a discussion of the findings and several conclusions are outlined.

THEORETICAL BACKGROUND

Figure 1 describes the adapted ACSM and the relationships among its major constructs. Customer satisfaction (CS) is a central construct of the model; it is affected by perceived quality (PQ), and perceived value (PV) of mobile phone services. In turn, customer satisfaction has a negative direct impact on customer complaints (CC) and a positive direct effect on both repurchase likelihood (RL) (i.e., the likelihood of purchasing additional services or renewing a contract with the current provider in future) and price tolerance (PT) (i.e., the probability of staying with the current provider if it increases prices or if a competitor decreases prices). Please refer to Fornell et al. (1996) for further justification and detail.

Since ACSM is both forward and backward looking, it depicts both the past customer experiences and their future attitudes towards the service; as such, it has both a predictive and analytical value. Prior Expectations (PE) is the key independent variable; and RL, CC and PT are the main dependant variables of the model that enable the predictive functionality of CS. Higher satisfaction results in higher repurchase likelihood and price tolerance, but in lower complaints rates. The ultimate purpose of the ACSM is to understand and explain customer behaviors. Thus, customer satisfaction, through its antecedents, can explain how consumers' past experience and evaluation regarding a particular provider form perceptions of satisfaction, which in turn, influences consumers' future dispositions and intentions regarding further patronizing of that provider.

The American Customer Satisfaction Model and its adaptations have been subjected to extensive validity testing is terms of various products and services. For example, it was applied to study customer satisfaction with the local government in New York City (Van Ryzin, Muzzio, Immerwahr, Gulick and Martinez, 2004) and to explore the behaviors and service perceptions of conference delegates (Gorst, Wallace and Kanji, 1999). In most prior projects, the ACSM research instrument exhibited acceptable levels of psychometric properties. The following links: PE-PQ, PQ-PV, PQ-CS, CS-PT, CS-CC, and CS-RL held true in all previous studies. Recently, the ACSM was applied to study wireless services in two independent studies (Tenenhaus, Vinzi, Chatelin and Lauro, 2005, Turel and Serenko, 2006). The former investigation reports on the insignificant PE-PV and PE-CS links, and the latter paper demonstrates the insignificance of PE-PV, PE-CS, CC-PT and CC-

RL relationships.[1] Based on the existing body of literature as well as these two projects, a set of hypotheses pertaining to the validity of the adapted ACSM is suggested. These hypotheses correspond to the paths in Figure 1.
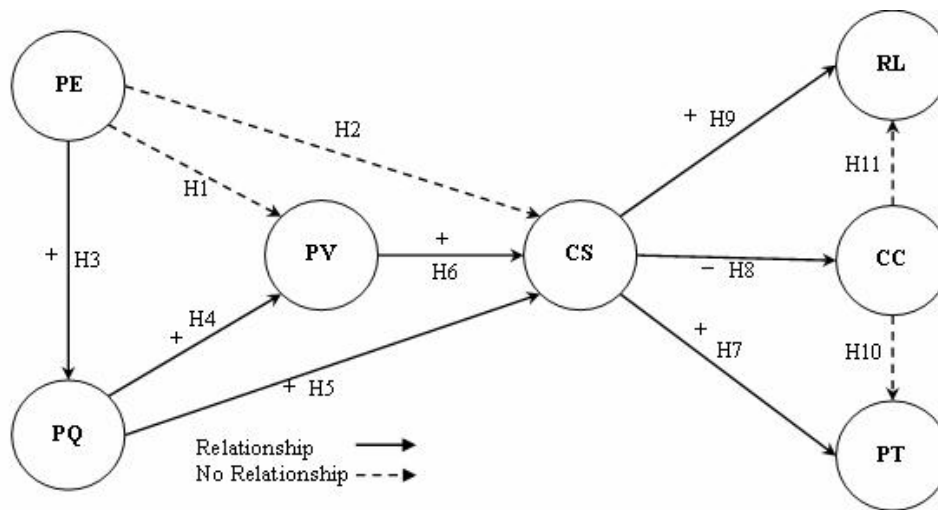

Figure 1: The Study Model

H1: Prior Expectations do not have a direct effect on Perceived Value of mobile phone services.

H2: Prior Expectations do not have a direct effect on Customer Satisfaction with mobile phone services.

H3: Prior Expectations have a positive direct effect on Perceived Quality of mobile phone services.

H4: Perceived Quality has a positive direct effect on Perceived Value of mobile phone services.

H5: Perceived Quality has a positive direct effect on Customer Satisfaction with mobile phone services.

H6: Perceived Value has a positive direct effect on Customer Satisfaction with mobile phone services.

H7: Customer Satisfaction has a positive direct effect on Price Tolerance towards mobile phone services.

H8: Customer Satisfaction has a negative direct effect on Customer Complaints regarding mobile phone services.

H9: Customer Satisfaction has a positive direct effect on Repurchase Likelihood of mobile phone services.

H10: Customer Complaints do not have a direct effect on Price Tolerance towards mobile phone services.

H11: Customer Complaints do not have a direct effect on Repurchase Likelihood of mobile phone services.

The nature of the hypotheses above is confirmatory, and together they form a context-specific adaptation of the ACSM theory. Overall, it is believed that testing these hypotheses contributes to the overall body of knowledge on the topic. At the same time, other new user-dependent variables may be included to further improve our understanding of the antecedents and consequences of customer satisfaction with mobile phone services.

Moderators

Moderators are variables that affect the strength or direction of relationships between exogenous and endogenous variables; they divide "a focal independent variable into subgroups that establish its domains of maximal effectiveness in regard to a given dependent variable" (Baron and Kenny, 1986, p. 1173). Moderators modify the relationships through re-allocations of the error terms or interactions with either dependent or independent variable . Despite their potential value, the usage of moderators is currently under-represented, especially, in MIS research (Sun and Zhang, 2006).

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[1] Tenenhaus et al. (2005) did not test the CC-PT and CC-RL links (i.e., these relationships were omitted).

The employment of moderators may potentially increase the predictive validity of a model under investigation, and explain the inconsistent findings in various disciplines (Judge, Bono, Thoresen and Patton, 2001). For instance, Sun and Zhang (2006) argue that low explanatory powers and factor inconsistencies of MIS models may be explained by the exclusion of important moderating variables reflecting individual differences, such as age and gender. Marketing scholars continue this line of reasoning by suggesting that age, income, and gender play a crucial role in affecting the strengths and directions of various relationships in many models (e.g., Roslow et al., 2000).

Despite various moderators exist, in this study, only demographic moderators such as age, income and gender were considered. The rationale was to select the most important moderators consistent with the previous body of knowledge. This study aims to test the possible moderating effects of consumer demographics on the ACSM within the context of mobile phone services. Specifically, changes in the structural relationships as depicted in Figure 1, depending on moderator levels, are examined.

Age is the first important personal characteristic within the category of demographic variables. From a marketing perspective, the identification of age groups within a population allows for market segmentation. Within the context of MIS, age was found to moderate a variety of construct relations. For example, it was demonstrated that age moderates technology adoption related relationships (Morris and Venkatesh, 2000, Venkatesh et al., 2003), and online shopping related relationships (Koufaris, 2002). Such studies demonstrate that different age groups think and behave differently, and as such, age may potentially moderate some of the ACSM's relationships. Thus, the following research question is proposed:

> Research Question 1: Does a person's age moderate the relationships among the constructs of the adapted American Customer Satisfaction Model in the context of mobile phone services?

Income is the second significant personal characteristic within the category of the demographic variables. From economic and marketing viewpoints, income is one of the major determinants of product and service demand, and is used for forming market segments with varying purchasing powers. Within the domains of MIS and marketing, income was found to moderate a variety of construct relations. For instance, it has been empirically demonstrated that income affects consumer purchasing behaviors (Roslow et al., 2000), consumptions patterns (Wong and Yu, 2002), and the usage of information and telecommunications technologies (Spithoven, 2005). These findings suggest that the identification of the role of income as a moderator of the ACSM is important. It is noted that in the present study the level of household (i.e., not individual) income was measured. The rationale is that most households rather than individuals pay their mobile service bills regardless of who brings a major part of the income to the family. Accordingly, the following research question is suggested:

> Research Question 2: Does a household's income moderate the relationships among the constructs of the adapted American Customer Satisfaction Model in the context of mobile phone services?

Gender is the third important personal characteristic considered in this study. Social scientists argue that gender differences are one of the aspects of cultural differences that exist among people. Gender roles are transferred through socialization, and men are taught to be more assertive, and women more nurturing. Many MIS and marketing studies demonstrate that there are perceptional and behavioral differences between males and females. For example, Gefen and Straub (1997) empirically showed that men and women differ in their perceptions but not in their usage of email. Furthermore, traditional gender role distinctions are commonly utilized to explain web-based services usage patterns and preferences (Morahan-Martin, 1998). In the technology acceptance context, gender and its interactions with other adoption predictors have been shown to affect adoption behaviors (Venkatesh et al., 2003). Therefore, it is important to continue investigating the moderating role of gender in other contexts. Thus, the research question below is suggested

> Research Question 3: Does a person's gender moderate the relationships among the constructs of the adapted American Customer Satisfaction Model in the context of mobile phone services?

METHODOLOGY AND RESULTS

In order to answer the study's hypotheses (i.e., the confirmatory part) and research questions (i.e., the exploratory part), a dataset of 1,253 American mobile phone users was subjected to Partial Least Squares (PLS) analysis. These data were collected in the first quarter of 2005 by the National Quality Research Center at the University of Michigan. Potential respondents were randomly chosen from the entire U.S. population (one from each household). The selected individuals were called and asked whether they currently utilized a mobile phone. Only those who employed mobile phones were allowed to participate in the survey. It is noted that even though the questions pertaining to the current mobile service providers were asked (e.g., provider's name), this information may not be released for confidentiality reasons. An acceptable level of response rate was achieved. Overall, it was believed that the study's subjects accurately represented the entire U.S. population of mobile phone users. The questionnaire items were adapted from Fornell et al. (1996). This instrument is

considered highly reliable and valid as demonstrated by various previous studies in marketing and MIS areas (Turel and Serenko, 2006).

According to the findings, 58% and 42% of the respondents were female and male respectively. Their average age was 45 years old, ranging from 18 to 83. Their average household income was approximately $60,000 (see Figure 2).
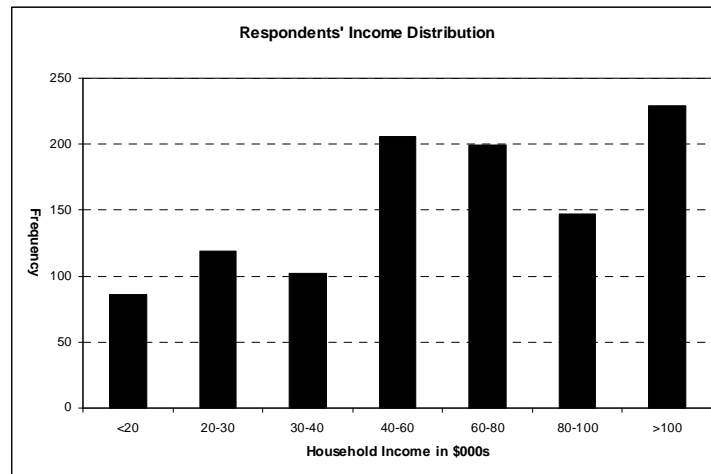

Figure 2: Income Distribution

The correlations between the moderating factors (age, gender, and income) were tested for descriptive purposes. Results show that respondent gender does not correlate with income or age. This indicates that similar age and income groups were sampled from both genders. While one may expect an income bias towards males (e.g., Levernier, Partridge and Rickman, 1998), this is not observed here. A potential explanation would be that household income is reported, which, for the most part, includes both males and females that confirms the validity of the data. Age and income were found to be marginally correlated (Spearman Rho of 0.1, $p < 0.001$). This is also understandable since senior personnel may receive higher wages, and individual salaries can increase over time.

Measurement Model

PLS analysis (Chin, 1998) was employed to validate the model because it has traditionally been used with the ACSM, and it handles deviation from normality relatively well (Thomas, Lu and Cedzynski, 2005). Table 1 presents a set of measurement items. The loadings of all items exceeded the required threshold of 0.7, the item-to-total correlations were above 0.35, and all Cronbach's Alphas were acceptable.

Item	Mean	Std dev	Loading	Error	Item-to-Total Correlation
PE1	7.73	1.83	0.799	0.358	0.554
PE2	8.06	1.77	0.874	0.236	0.615
PE3	7.13	2.18	0.743	0.451	0.465
PQ1	7.26	2.35	0.927	0.142	0.819
PQ2	7.14	2.49	0.932	0.132	0.827
PQ3	6.96	2.65	0.873	0.238	0.746
PV1	6.64	2.49	0.954	0.093	0.834
PV2	6.96	2.46	0.961	0.077	0.834
CS1	7.14	2.47	0.952	0.095	0.884
CS2	6.29	2.52	0.933	0.134	0.850
CS3	6.41	2.57	0.918	0.162	0.822
PT	10.40	8.39	1.000	0.000	-
CC	41%	-	1.000	0.000	-
RL	6.94	3.09	1.000	0.000	-

Table 1: Measurement Items

A matrix of loadings and cross-loadings was constructed to test discriminant validity (Table 2), which showed that all items had higher loadings with their corresponding factors in comparison to their cross-loadings. Fornell and Larcker's (1981) measures of internal consistency and convergent validity of all constructs were greater than the 0.7 and 0.5 thresholds respectively

	PE	PQ	PV	CS	PT	CC	RL
PE1	**0.799**	0.171	0.168	0.170	0.076	-0.052	0.163
PE2	**0.874**	0.223	0.178	0.206	0.091	-0.062	0.198
PE3	**0.743**	0.207	0.107	0.172	0.057	-0.074	0.135
PQ1	0.222	**0.927**	0.644	0.804	0.342	-0.360	0.738
PQ2	0.207	**0.932**	0.665	0.847	0.343	-0.350	0.736
PQ3	0.170	**0.873**	0.570	0.688	0.257	-0.364	0.623
PV1	0.181	0.724	**0.954**	0.798	0.357	-0.323	0.673
PV2	0.181	0.817	**0.961**	0.843	0.344	-0.358	0.719
CS1	0.174	0.838	0.700	**0.952**	0.390	-0.409	0.808
CS2	0.171	0.781	0.668	**0.933**	0.363	-0.367	0.750
CS3	0.200	0.787	0.673	**0.918**	0.397	-0.331	0.746
PT	0.081	0.342	0.312	0.414	**1.000**	-0.182	0.446
CC	-0.049	-0.318	-0.211	-0.331	-0.158	**1.000**	-0.336
RL	0.171	0.737	0.618	0.821	0.446	-0.360	**1.000**

Table 2: Matrix of Loadings and Cross-Loadings

). The square root of the average variance extracted was compared to the construct correlations

	PE	PQ	PV	CS
Arithmetic Mean	7.64	7.12	6.8	6.61
Cronbach's Alpha	0.73	0.90	0.91	0.93
Internal Consistency	0.848	0.936	0.956	0.952
Convergent Validity	0.651	0.830	0.915	0.870

Table 3: Construct Statistics

). All values along the diagonal were greater than those in corresponding rows and columns. Convergent validity was also estimated by analyzing the *t*-tests for all item loadings (Anderson and Gerbing, 1988), and all *t*-values were significant. Therefore, it is believed that the discriminant and convergent validities are assured. It is noted that some construct correlations are relatively high. This, however, is common in the usage of the ACSM and does not threaten the validity of the psychometric properties of the instrument (Dow et al., 2006).

	PE	PQ	PV	CS	PT	CC	RL
PE1	**0.799**	0.171	0.168	0.170	0.076	-0.052	0.163
PE2	**0.874**	0.223	0.178	0.206	0.091	-0.062	0.198
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CS1	0.174	0.838	0.700	**0.952**	0.390	-0.409	0.808
CS2	0.171	0.781	0.668	**0.933**	0.363	-0.367	0.750
CS3	0.200	0.787	0.673	**0.918**	0.397	-0.331	0.746
PT	0.081	0.342	0.312	0.414	**1.000**	-0.182	0.446
CC	-0.049	-0.318	-0.211	-0.331	-0.158	**1.000**	-0.336
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Internal Consistency	0.848	0.936	0.956	0.952
Convergent Validity	0.651	0.830	0.915	0.870

Table 3: Construct Statistics

	PE	PQ	PV	CS
PE	**0.807**			
PQ	0.249	**0.911**		
PV	0.214	0.807	**0.957**	
CS	0.228	0.889	0.858	**0.933**

Table 4: Correlation Matrix and Discriminant Validity

Structural Model

Bootstrapping with 250 re-samples was done to derive *t*-statistics for parameter estimates (Chin, 1998). Based on the results, all hypotheses were supported (i.e., links H1, H2, H10 and H11 were rejected, and H3 – H9 were supported). In order to further demonstrate the insignificance of rejected links, those relationships were dropped, and the model was re-evaluated. Since the removal of these links did not have any influence on the model, it was concluded that those relationships were in fact insignificant. The model has a high predictive power in terms of customer satisfaction; it explains almost 85% of the construct's variance (Figure 3).
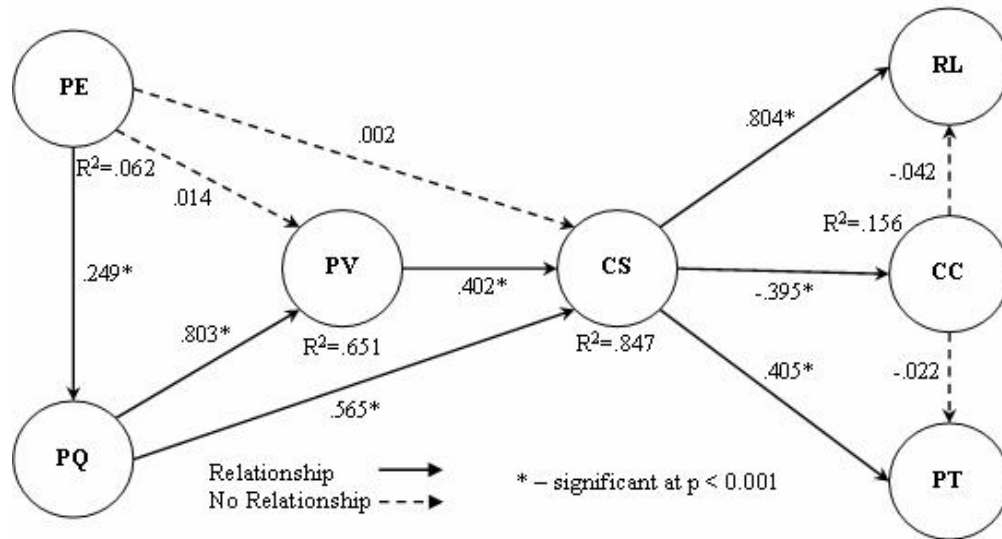
Figure 3: The Structural Model

Moderation Analysis

In order to answer Research Questions 1, 2 and 3, moderation analysis was done. For this, the dataset was split into two equal parts for each moderator. This is a common approach in management research (Igbaria, Parasuraman and Badawy, 1994). Specifically, the cut-off points for age and household income were 45 years old and $60,000 per year respectively. In the case of gender, two datasets (i.e., male and female) were construed. A series of Chow tests (Chow, 1960) was done for each moderator individually (see Table 5). Chow tests may be utilized to determine statistical significance of the difference between the strength of relationship among variables from two datasets. It is noted that some *n* values do not add to 1,253 because of missing variables (e.g., some people did not reveal their age, income, or gender - that is common in survey research).

Link – beta and F/p-value	PE-PQ	PQ-PV	PQ-CS	PV-CS	CS-PT	CS-CC	CS-RL	R²-CS
Age Moderation								
Age – younger (n=612)	0.205	0.792	0.583	0.304	0.398	-0.373	0.816	0.847
Age – older (n=598)	0.310	0.816	0.555	0.413	0.428	-0.423	0.826	0.852
F(3; 1,204)	17.87	14.18	24.52	16.04	21.75	16.43	15.34	24.46
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Income Moderation								
Income – lower (n=514)	0.292	0.819	0.555	0.401	0.451	-0.414	0.829	0.831
Income – higher (n=577)	0.220	0.824	0.567	0.406	0.378	-0.362	0.807	0.867
F(3; 1,085)	56.90	85.88	66.46	68.35	63.74	50.57	46.14	69.57
p-value	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Gender Moderation								
Gender – male (n=526)	0.243	0.779	0.592	0.376	0.447	-0.393	0.812	0.839
Gender – female (n=727)	0.250	0.825	0.541	0.425	0.401	-0.401	0.826	0.852
F(3; 1247)	0.75	1.45	0.57	1.61	3.70	2.05	0.71	1.53
p-value	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

Table 5: The Chow Tests of Moderation Effects

DISCUSSION AND CONCLUSION

Based on the obtained results, it is believed that the purpose of the study was achieved, and several conclusions can be made. First, this project confirms the validity and robustness of the adapted ACSM. It demonstrates that the ACSM may be successfully modified to study the antecedents and consequences of user satisfaction with information technologies, and particularly, with mobile phone services. The study's model behaved as expected; customer satisfaction was influenced by perceived quality and perceived value, but not by pre-purchasing expectations. This demonstrates that the effect of pre-

purchasing expectations on customer satisfaction is fully mediated by perceptions of the quality of mobile phone services. A potential theoretical explanation of this indirect effect is that users need to have some degree of experience with a service before they may form reliable perceptions of satisfaction. That is, expectations are meaningless before they are contrasted with the actual experience. As expected, it was also found that users reporting on higher satisfaction tend to repurchase new or additional services from their current service provider, and stay with their provider, even if it increases prices or if a competitor decreases prices. At the same time, highly satisfied customers complain less frequently than those who are dissatisfied. The model also shows high predictive power because it explains almost 85% of customer satisfaction variance. Overall, these observations are consistent with prior research.

Second, age moderates all of the model's relationships, such that most of the links are stronger for older people (with the exception of the PQ-CS link). As a result, the explanatory power of the model for older mobile phone users (age over 45) is higher than that of younger users (below 45). Older users put more emphasis on expectations in forming quality perceptions. Similarly, they rely more on quality when forming value perceptions. Younger users, however, consider quality when forming satisfaction perceptions more than older users do. This implies that the actual quality of mobile service is more important for younger users than for older ones. Satisfaction has greater impacts on price tolerance, compliant behavior, and repurchase-likelihood in the older age group. This suggests that improvements in customer satisfaction have better results with older users. Thus, wireless service providers may target this market segment for service improvements. For example, they may offer better monthly plans for this segment, improve its value perceptions, and indirectly, enhance its satisfaction with the services.

Third, income moderates all of the model's relationships. Lower income users (household income below $60K) strongly emphasize expectations in forming their actual quality perceptions. For these individuals, satisfaction has stronger effects on behavioral outcomes, such as repurchase, price tolerance and complaining. Individuals with higher income (household income over $60K) put a stronger emphasis on quality and value for money as determinants of their satisfaction. As such, they have a higher awareness of the fee they pay for mobile phone services, and the quality they receive in return. Thus, wireless service providers may satisfy this segment and increase its satisfaction by reducing prices and improving quality. This, however, may be difficult to operationalize. As such, service providers are better off addressing the satisfaction of lower income users through setting the right expectations. This may result in better behavioral outcomes.

Fourth, gender does not moderate any of the model's relationships. That is, female and male users follow a similar pattern of perception development in forming satisfaction assessments, and behavioral outcomes. These findings are consistent with the ambiguity associated with the role of gender in MIS models. While some studies report on gender effects for only a subset of the population (e.g., for older employees, Morris and Venkatesh, 2000), others report on partial gender effects (Gefen and Straub, 1997), or no gender effects (Wachter, 1999). Nevertheless, these studies were not conducted in the mobile services context, nor have they applied the ACSM. As such, it is proposed based on the findings that gender has no effect on the examined relationships in the mobile services context. A potential explanation is that mobile phones are modern IT artifacts that are used in a variety of situations (not just work-related tasks) to address hedonic and utilitarian needs. As such, the classic gender roles, which are mostly tied to work related situations, have lower influence on user perceptions and behaviors in the mobile services context. Given this observation, service providers should put an equal emphasis on the male and female market segments.

Overall, these findings offer academic and practical implications. For researchers, the findings validate a model that examines the antecedents and outcomes of user satisfaction with mobile phone services. In addition, this investigation contributes to the current knowledge by filling a gap in the current literature regarding the moderating effects of consumer demographics on the ACSM in the mobile phone services industry. For mobile service providers, the findings suggest a certain market segmentation they should consider, and potential avenues of action they may take in order to improve desirable outcomes, such as higher retention and price tolerance, and a lower number of complaints. In addition, the findings may potentially enable researchers to apply similar approaches in other areas of interest and assist managers in the development of promotional, satisfaction, and loyalty programs.

REFERENCES

1. Anderson, E. W. and Fornell, C. (2000) Foundations of the American Customer Satisfaction Index, *Total Quality Management & Business Excellence,* 11, 7**,** 869-882.
2. Anderson, J. C. and Gerbing, D. W. (1988) Structural Equation Modeling in practice: A review and recommended two-step approach, *Psychological Bulletin,* 103, 3**,** 411-423.

3. Baron, R. M. and Kenny, D. A. (1986) The Moderator Mediator Variable Distinction in Social Psychological-Research - Conceptual, Strategic, and Statistical Considerations, *Journal of Personality and Social Psychology,* 51, 6**,** 1173-1182.

4. Chin, W. W. (1998) The Partial Least Squares approach for Structural Equation Modeling, In: *Modern methods for business research*(Ed, Marcoulides, A.) Lawrence Erlbaum Associates, Mahwa, N.J., pp. 295-336.

5. Chow, G. C. (1960) Tests of equality between sets of coefficients in two linear regressions, *Econometrica,* 28, 3**,** 591-605.

6. Dow, K., Serenko, A., Turel, O. and Wong, J. (2006) Antecedents and consequences of user satisfaction with email systems, *International Journal of E-Collaboration,* 2, 2**,** 46-64.

7. Fornell, C. (1992) A National Customer Satisfaction Barometer: The Swedish Experience, *Journal of Marketing,* 56, 1**,** 6-21.

8. Fornell, C. (2001) The science of satisfaction, *Harvard Business Review,* 79, 3**,** 120-121.

9. Fornell, C. (2005) Q1 2005: Transportation; Information; Utilities; Health Care and Accommodation & Food Services: Commentary by Class Fornell, http://www.theacsi.org/scores_commentaries/commentaries/Q1_05_comm.htm, Accessed Jan. 15, 2006

10. Fornell, C., Johnson, M. D., Anderson, E. W., Cha, J. and Bryant, B. E. (1996) The American Customer Satisfaction Index: Nature, purpose, and findings, *Journal of Marketing,* 60, 7**,** 7-18.

11. Fornell, C. and Larcker, D. F. (1981) Evaluating structural equation models with unobservable variables and measurement error, *Journal of Marketing Research,* 18, 1**,** 39-50.

12. Gefen, D. and Straub, D. (1997) Gender differences in the perception and use of e-mail: An extension to the technology acceptance model, *MIS Quarterly,* 21, 4**,** 389-400.

13. Gorst, J. K., Wallace, W. and Kanji, G. K. (1999) Customer satisfaction at the Sheffield World Congress, 1998, *Total Quality Management,* 10, 4/5**,** 561-568.

14. Igbaria, M., Parasuraman, S. and Badawy, M. K. (1994) Work experiences, job involvement, and quality of work life among information systems personnel, *MIS Quarterly,* 18, 2**,** 175-201.

15. Judge, T. A., Bono, J. E., Thoresen, C. J. and Patton, G. K. (2001) The job satisfaction - job performance relationship: A qualitative and quantitative review, *Psychological Bulletin,* 127, 3**,** 376-407.

16. Koufaris, M. (2002) Applying the Technology Acceptance Model and Flow Theory to online consumer behavior, *Information Systems Research,* 13, 2**,** 205-223.

17. Levernier, W., Partridge, M. D. and Rickman, D. S. (1998) Differences in Metropolitan and Nonmetropolitan U.S. Family Income Inequality: A Cross-County Comparison, *Journal of Urban Economics,* 44, 2**,** 272-290.

18. Lin, H.-H. and Wang, Y.-S. (2005) An examination of the determinants of customer loyalty in mobile commerce contexts, *Information & Management,* In Press, Corrected Proof.

19. Morahan-Martin, J. (1998) Males, females and the Internet, In: *Psychology and the Internet: Intrapersonal, Interpersonal, and Transpersonal Implications*(Ed, Gackenbach, J.) Academic Press, San Diego, CA, USA, pp. 169-197.

20. Morris, M. G. and Venkatesh, V. (2000) Age differences in technology adoption decisions: Implications for a changing work force, *Personnel Psychology,* 53, 2**,** 375-403.

21. Roslow, S., Li, T. and Nicholls, J. A. F. (2000) Impact of situational variables and demographic attributes in two seasons on purchase behavior, *European Journal of Marketing,* 34, 9/10**,** 1167-1180.

22. Shim, J. P. (2005) Why Japan and Korea Are Leading in the Mobile Business Industry, *Decision Line,* 36, 3**,** 8-12.

23. Spithoven, A. H. G. M. (2005) Distribution of income and the structure of economy and society, *International Journal of Social Economics,* 32, 1/2**,** 133-154.

24. Sun, H. and Zhang, P. (2006) The role of moderating factors in user technology acceptance, *International Journal of Human Computer Studies,* 64, 2**,** 53-78.

25. Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M. and Lauro, C. (2005) PLS path modeling, *Computational Statistics & Data Analysis,* 48, 1**,** 159-205.

26. Thomas, R. D., Lu, I. R. R. and Cedzynski, M. (2005) Partial Least Squares: A critical review and a potential alternative, *Administrative Sciences Association of Canada (ASAC) Conference*, Toronto, Ontario, Canada.

27. Turel, O. and Serenko, A. (2006) Satisfaction with Mobile Services in Canada: An Empirical Investigation, Telecommunication Policy, 30 (5-6), pp. 314-331, June-July.

28. Turel, O., Serenko, A. and Bontis, N. (2005) User acceptance of Short Messaging Services: The convergence of marketing and MIS views, *the 11th Americas Conference on Information Systems (AMCIS)*, Omaha, NE, USA.

29. Van Ryzin, G. G., Muzzio, D., Immerwahr, S., Gulick, L. and Martinez, E. (2004) Drivers and consequences of citizen satisfaction: An application of the American Customer Satisfaction Index Model to New York City, *Public Administration Review,* 64, 3**,** 331-341.

30. Venkatesh, V., Morris, M. G., Davis, G. D. and Davis, F. D. (2003) User acceptance of information technology: Toward a unified view, *MIS Quarterly,* 27, 3**,** 425-478.

31. Wachter, R. M. (1999) The effect of gender and communication mode on conflict resolution, *Computers in Human Behavior,* 15, 6**,** 763-782.

32. Wong, G. K.-M. and Yu, L. (2002) Income and social inequality in China: impact on consumption and shopping patterns, *International Journal of Social Economics,* 29, 5**,** 370-384.