

## INTERNET USE AND SOCIABILITY IN MAINLAND CHINA AND HONG KONG

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### ABSTRACT

*Given the anticipated prosperous Chinese-based market in the near future, a better understanding of the social implications of the Internet among the Chinese population is needed. The current study explored the relation between Internet use and sociability based on an in-house survey of 2500 adult residents in Beijing and Guangzhou in mainland China and a telephone survey of 1007 adult residents in Hong Kong.*

*Three multi-way ANOVAs showed no impact of Internet use on household socializing, socializing with friends, and family interactions in either sample. The results were parallel to the patterns found in an equivalent study in the U.S. The present finding suggests that Internet users live in both the online world and the offline world, and can shift back and forth between the two worlds simultaneously. Social implications of the different functions that offline and online communications serve were discussed.*

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*Support of this research was provided by a Competitive Earmarked Research Grant (City U 1152/00H) from the University Grants Committee of Hong Kong.*

The birth of the Internet offers a set of distinctive communication features—e.g., digital convergence, many-to-many communication, increasing possibilities for audience interactions, transcendence of the constraints of time and space, collaborative mass communication, virtuality, interactivity, and globalization. This allows communication researchers to examine many new forms of communication (e.g., various forms of online communication), as well as their antecedents and affects.

Recent years have witnessed a remarkable growth in scholarship addressing the topic of the Internet. Several prevalent approaches to studying the Internet as a communication topic include (December 1996; Zhu & He 2002a, 2000b):

- (1) exploring the diffusion and adoption patterns of the Internet at individual, organizational and societal levels;
- (2) exploring the societal and individual factors contributing to the diffusion and adoption patterns;
- (3) examining media selection in individual and organizational communication;
- (4) examining possible societal changes as a result of Internet diffusion and adoption;
- (5) identifying the sociopsychological characteristics of individuals using the Internet;
- (6) examining the impact of Internet adoption and use on individuals' daily-life routines;
- (7) researching individual online experience in relation to the reconstruction of one's identity and rekindling of the sense of community; and
- (8) researching the language and rhetoric used on the Internet.

Although communication research on the Internet has proliferated in recent years, there is a paucity of studies attempting to address the possible linkage between people's online and offline communication—as well as insightful theoretical frameworks to guide Internet research. Moreover, a comparative analysis across cultures or societies approach in Internet research is rare.

The current study explores the impact of Internet use on sociability in mainland China and Hong Kong from a comparative approach. In the study, sociability is measured by questionnaire items on face-to-face household socializing, socializing with friends and family interactions. In previous research, while attention has been paid to exploring possible new patterns and modes displayed by individuals in various online contexts, the fact that “every Internet user has an offline world” seems to have been overlooked. It is necessary and informative to conceptualize, or at least to acknowledge, that Internet users have both online worlds and offline worlds, and that they are able

to shift back and forth or to live in them simultaneously. The approach may offer some new insights to better understand the social implications of Internet use.

Examination of the impact of peoples' online communication on their offline communication may shed some light on the question of how Internet users deal with these two worlds. If effects are found, they may signify a possible gradual merger of the two worlds (i.e., the online world has penetrated into the offline world). If no effects are found, they may suggest perceived separateness of online and offline worlds with perceived different functioning modes among Internet users. As such, either of the findings assists with knowledge of the social impact of the Internet.

In examining the impact of Internet use on sociability, a theoretical framework is urgently needed. Such a claim is primarily based on the observation that most empirical investigations on the Internet have been descriptive in nature. Data without a theoretical perspective can become fragmented and lacking in ability to grasp the bigger picture. In this study, the conceptual framework developed by Dutton, Rogers and Jun (1987) for research on home computing is seen as highly applicable to research on the Internet, because home computing is one of the significant precursors of Internet adoption and use. Importantly, that model emphasizes the diffusion process of the Internet from adoption, to use, to impact in an integrative way.

The call for theory-driven research on the Internet *also* bears on observations that there is a lack of connection between social structural antecedents in the Internet studies. While focusing on the diffusion process in various particular societies, researchers have often neglected the influences of the macro factors such as social networks, community, society, culture, economic development and political systems on the diffusion, use and effects (DUE) process of the Internet. A theory-driven approach is thus needed to conceptually connect the macro aspects of society to the more micro aspects of the DUE process at the individual level. In a comparative approach, various aspects of the societal factors are contrasted between societies. As such, it allows a better understanding of the exact nature of the societal influences on the DUE process by taking the possible macro factors into account (Zhu, Weaver, Lo, Chen & Wu 1997).

The present study follows this comparative approach to examine the social impact of Internet use on sociability in mainland China and Hong Kong. The comparable data from the United States (Cole and Robinson 2002; the previous article) are also included as an anchor point. It is believed that it is worthwhile to examine the Chinese data for both theoretical and practical considerations:

- (1) A non-Western study may add new insights to the existing Internet studies that are largely Western-based.

- (2) Chinese societies are fundamentally and profoundly different from Western societies in various ways such as political and socio-economic development, culture, and history of technological development.
- (3) Culturally-comparative research would allow the applicability of the Western-originated Dutton, Rogers, and Jun framework to a Chinese-based context.
- (4) Given the anticipated prosperous Chinese-based market in the near future, a better understanding is needed of the social implications of the Internet among the Chinese population.

### **THEORETICAL FRAMEWORK**

Dutton, Rogers and Jun's (1987) theoretical framework originally focuses on the adoption, use and impact of home computers. Applying their framework to the context of Internet adoption and use, it could be said that the Internet diffusion process involves three stages: The first stage is diffusion of the Internet which includes, or rather presumes, the adoption of home PC, web, broadband, mobile phone, mobile PDA, or other devices that can be connected to the Internet. The adoption of any of the above items would affect the second stage of the process, namely, use of the Internet. Dimensions of Internet use include amount of time, content preferred, channels visited, language of the sites visited, among many other aspects. At the third stage, use of the Internet is expected to have impact on individuals in knowledge, attitudes, values and behaviors in work or study, family life, community activities, and even national or international affairs. Dutton, Rogers and Jun (1987) maintain that individual socioeconomic and demographic characteristics, perceptions and attitudes, family characteristics, and societal characteristics serve as exogenous variables having a direct impact on each of the three stages.

The current study examines the impact of Internet use on sociability, that is, the communication behaviors with family members and friends in mainland China and Hong Kong. In other words, it focuses on examining the second and third stages of the Internet diffusion process.

Previous studies have shown inconsistent results in the social impact of home computing: Some studies have found that adoption and use of home computing have a negative impact on family harmony (Rogers, Daley and Wu 1982), less time with family and friends (Vitalari, Venkatesh and Gronhaug 1985), more time alone (Venkatesh and Vitalari 1986), and less reported leisure time (Rogers *et al.*, 1982); whereas some found none (Caron, Girous and Douzou 1985). Two questions have arisen from the above studies on home computing: (1) What kind of social impact would Internet use have? (2) Would a Chinese-based sample display similar patterns with the Western ones in Internet use and sociability? If yes, what would that imply? If not, what conclusions could then be drawn?

Several studies have been attempted to answer the first question. Similar to what has been found in the relationship between home computing and sociability, inconsistent results were found. For instance, Kraut and his colleagues (1998) found that increased Internet use was associated with less family communication, smaller social circles, more loneliness and more depression. However, that result was not sustained when that research team attempted a replication study (Kraut *et al.* 2002). Moreover, the analysis of UCLA data by Yamauchi and Coget (2002) found that none of the negative effects appeared in their study. These contradictory findings point to the need for further research on this topic.

### COMPARATIVE APPROACH

A distinctive advantage of comparative communication research lies in its ability to test the impact of society on individual behaviors (Zhu, Weaver, Lo, Chen and Wu 1997). Indeed, it is only through engaging in comparative research that societal-level influences could be examined: when a single society is studied, societal influences become a constant in which everyone shares the same value in the society, and thus cannot be observed. Zhu *et al.* (1997) maintain that two-nation comparisons often turn out to be problematic since multidimensional influences at the societal level are likely to be confounded with each other, making the influencing factors hard to disentangle. As a result, *ad hoc* speculations are made to explain any observed differences found.

Zhu *et al.* (1997) draw on Przeworski and Teune's (1981) suggestion to adopt a theory-driven approach to the problem: a quantifiable measure of certain "national-level variables" should be developed and explicitly built into the comparison. As such, differences along societal-level variables, instead of among societies *per se*, could be consciously tracked. At least three societies are needed to operationally separate societal-level variables from societies. In their study, Zhu and his colleagues applied the comparative approach to examine individual, organizational, and societal influences on medial role perceptions in journalists in China, Taiwan and the United States.

Adopting the approach used in Zhu *et al.*'s (1997) study, the present study compares the data found in mainland China and Hong Kong with Cole and Robinson's (2002) reanalysis of the UCLA data. Two specific aspects of societal factors are chosen due to their relevance to Internet development in a society. They are the politico-techno environment and the cultural tradition of the society. This conceptualization offers two competing models that call for comparison along societal-level variables on the impact of Internet use on sociability:

*Model 1—Politico-Techno Environment, which underscores the impact of the politico-techno environment:* This model argues that the relationship between Internet use and sociability is a function of political control over web content and technological infrastructure for Internet diffusion. Light control and

advanced infrastructure (as in Hong Kong and the U.S.) would encourage people to spend more time on the Internet and thus might lead to less time on socializing with family members, relatives and friends. On the other hand, tight control and inadequate infrastructure (as in mainland China) offer less incentive for people to get online. Sociability might be preserved better under such an environment. If this assumption holds, one will then expect to see a negative correlation between Internet use and sociability in the U.S. and Hong Kong, but no relationship between the two in mainland China.

*Model 2—Cultural Tradition, which emphasizes the impact of cultural tradition of a society:* According to this model, the relationship between Internet use and sociability is moderated by the predominant cultural values of the society. Under this model, the Chinese in both mainland China and Hong Kong share the same cultural roots that emphasize the importance of family bonding, parenting, parent-child communication, etc. (Berndt, Cheung, Lau, Hau and Lew 1993; Bond 1986; Chen, Dong and Zhou 1995; Chiu, Feldman and Rosenthal 1992; Yu 1984). Despite the changes in family size and structure/pattern that have taken place in both mainland China and Hong Kong in recent years, these Confucian values have largely prevailed. The collectivistic mindset of Chinese people also puts strong emphasis on relationships with others (Hofstede 1980). Maintenance of harmonious relationships comes first before individual needs and wants in Chinese culture (Ho, Spinks and Yeung 1989). As such, people in mainland China and Hong Kong are different from their U.S. counterparts, who are typically characterized as more oriented to individualism (Hofstede 1980). In short, the model posits that the impact of Internet use on sociability should be similarly weak in Hong Kong and mainland China, compared with that in the U.S.

In addition to the above alternative hypotheses, there are three other possible scenarios as predicted by Zhu *et al.*'s (1997) models shown in Table 1:

*Model 3—Theoretically Invalid:* A scenario described by Zhu *et al.* (1997) as “empirically possible but conceptually implausible” in which the United States and China have the same characteristics in Internet development, and both are distinct from Hong Kong. Zhu *et al.* (1997) assert that one should raise concerns about the validity of the data if this strange pattern showed up. An attempt to search for ad hoc explanations would violate the spirit of comparative research.

*Model 4—Real Cause(s) Misspecified:* There is another possibility, that all three groups share nothing in common between any of the pairs. If model 4 is found, this would suggest that one has missed some other important variable(s) at the societal level that explain the unique pattern of each group.

*Model 5—No Societal Affects:* If no significant difference is found among the three societies, two implications are possible: (1) that the two societal

**TABLE 1: A CONCEPTUAL SCHEME FOR COMPARING INTERNET USE AND ITS AFFECTS IN THE UNITED STATES, CHINA AND HONG KONG**

<b>Model Prediction</b>	<b>Mainland China</b>	<b>HK</b>	<b>USA</b>
Politico-Techno Environment	Different	Same	Same
Cultural Traditional	Same	Same	Different
Conceptually Implausible	Same	Different	Same
Predictors Misspecified	Different	Different	Different
No Societal Affects	Same	Same	Same

variables under study—the politico-techno environment and cultural-traditional society—provide no explanations about the impact of Internet use on sociability; or (2) that a poorly designed measurement has been used. See Table 1 for a summary comparison of all five models.

### **SURVEY METHODS**

*Sampling:* Two data sets are used in the current study. The first was based on face-to-face interviews of 2,500 adult residents in two major cities (Beijing and Guangzhou) in mainland China, whereas the second was based on telephone interviews of 1007 adult residents in Hong Kong. Although both surveys were conducted at the end of 2000, asking the same questions, they are separately analyzed to account for differences in interview modes and social contexts.

The mainland sample was generated through a multi-stage, non-proportional probability sampling (NPPS) procedure (see Zhu and He 2002a for more details). Briefly, 100 residential communities were first randomly selected from Beijing and 150 from Guangzhou; 10 households were then randomly selected from each of the chosen residential communities. At the final stage, an adult between the ages of 18 and 74 was selected, based on a random number table, from each of the chosen households. The completed sample consists of 2664 respondents, with 1116 from Beijing and 1548 from Guangzhou, which translates into a sampling error of +/- 1.9 percent for the entire sample at the 95 percent confidence level.

The Hong Kong sample was generated through a random digital dialing (RDD) procedure. Calls were made, up to five times, to the chosen phone numbers. An adult member between 18 and 74 from each contacted household was selected, based on the last birthday method, for an interview (see Zhu and He 2002b for details). The completed sample consists of 1007 respondents, which translates into a sampling error of +/- 3 percent at the 95 percent confidence level.

As calculated using the RR3 formula of the American Association for Public Opinion Research (2000), the response rate is 50 percent for the mainland sample and 38 percent for the Hong Kong sample. Both samples have been weighted to match the age-sex composition of their respective populations.

*Measurement:* Constrained by interview time, only two sociability questions were adopted from the UCLA Internet Project: (1) the amount of time spent on talking with family members, (2) and the amount of time spent on socializing with friends or relatives. Both were measured in terms of number of minutes per week. While the two measures are positively correlated (.26,  $p < .001$  for the mainland sample, and .17,  $p < .001$  for the Hong Kong sample), the magnitude of the correlations is moderate. Therefore, the two are kept as separate measures in the subsequent analysis.

In addition, a battery of four items on interactions with family members were adopted by other teams in the Chinese Internet Use Survey (CIUS) group—including mainland China, Hong Kong, Taiwan, Macau and Singapore. The four questions assessed the number of days per week the respondent was together with family members (a) dining, (b) watching TV, (c) playing, or (d) shopping, all measured on a 0–7 scale with 0 for none at all and 7 for every day of the week. The four items were combined to form a composite scale of Family Interactions based on the reasonably high coefficient of internal consistency coefficient (Cronbach's  $\alpha = .69$  for the mainland sample and .68 for the Hong Kong sample).

Following Cole and Robinson (2002), the six independent variables in the current study, included age, sex, education, family income, marital status and Internet use (race was not included because over 95% of the population in both the mainland and Hong Kong is Chinese.) Internet use was measured as the total number of minutes spent using the Internet at workplace, home, or elsewhere. All online activities, including Web browsing, email, chatting, shopping, and online games, were counted toward the measure.

## RESULTS

The results are reported in a Multiple Classification Analysis format in Tables 2, 3 and 4. Table 2 reports the adjusted deviation scores in Household Socializing by five demographic variables and Internet Use between Hong Kong and mainland China, Table 3 presents the adjusted deviation scores in Socializing with friends by the same demographic variables and Internet use, and Table 4 shows the adjusted deviation scores in family interactions. Equivalent results have been included from Cole and Robinson's (2002) analysis in the United States in Tables 2 and 3 for comparative purposes.

*Impact on Household Socializing:* As shown in Table 2, the average estimates for time spent with other household members were 9.8 hours per week in mainland China and 13.1 hours in Hong Kong. In comparison, their U.S. counterparts reported an average estimate of 28.7 hours per week. Despite the differences, which might stem from methodological factors (e.g., the hours might have been understated by the Chinese and/or overstated by the Americans),

**TABLE 2: DIFFERENCES IN FAMILY SOCIABILITY BY DEMOGRAPHICS AND INTERNET USE (MCA ADJUSTED)\***

	Mainland China (N = 1,798)	Hong Kong (N = 1,007)	U.S.# (N = 1,774)
TOTAL SAMPLE	9.8 Hours	13.1 Hours	28.7 Hours
<b>Age</b>			
18-24	1.1	1.1	0
25-34	1.4	0.3	1.1
35-44	-0.7	2.4	1.2
45-54	-1.0	-0.2	-5.1
55-64	-0.1	-4.1	-.8
65-74	-0.3	-6.2	5.3
Correlation	.09 --> .11 Sig.	.21 --> .19 Sig.	.15 --> .13 Sig.
<b>Education</b>			
Elementary School	1.5	-0.6	NA
Middle School	0.6	2.1	-4.8
High School	0.2	0.0	-.8
Some College	-1.1	-2.1	1.0
College Graduate & Above	-0.9	-1.2	1.0
Graduate School	-0.9	-1.2	3.4
Correlation	.10 --> .09 Sig.	.14 --> .10 NS	.06 --> .09 NS
<b>Family Income</b>			
Low	0.3	-0.1	3.3
Medium Low	0.0	1.0	1.9
Medium High	-0.2	0.3	-4.0
High	0.1	-0.9	1.0
No Data	NA	-1.0	.2
Correlation	.03 --> .02 NS	.12 --> .06 NS	.10 --> .12 NS
<b>Marital Status</b>			
Married/Living together	0.9	1.5	1.5
Divorced	-2.4	-3.6	-2.5
Separated	-2.4	-3.6	-1.7
Widowed	-2.4	-3.6	-6.0
Single	-2.8	-3.0	-5.8
Correlation	.15 --> .18 Sig.	.14 --> .16 Sig.	.12 --> .12 Sig.
<b>Sex</b>			
Male	-0.1	0.2	-1.9
Female	0.2	-0.2	1.5
Correlation	.03 --> .02 NS	.01 --> .02 NS	.05 --> .06 NS
<b>Internet Use</b>			
None	0.1	-0.2	1.2
0.1-1.9 Hrs	-1.7	-0.2	-1.1
2.0-4.9 Hrs	0.1	-1.2	-.5
5.0-9.9 Hrs	0.3	0.4	-1.2
10.0+ Hrs	-0.4	1.4	.1
Correlation	.08 --> .04 NS	.02 --> .05 NS	.05 --> .04 NS

\* Entries are deviations from the total sample mean. Correlations are for before and after MCA adjustment. Sig. = Eta correlation is significant at .05 level after MCA adjustment vs. NS = Not Significant.

# As reported in Cole and Robinson (2002).

there appears to be a consistent pattern in terms of the relationship between family socializing and the demographic variables/Internet use. In the case of age, the MCA adjusted correlations with household socializing were .11 and .19 for mainland China and Hong Kong respectively, both of which were statistically significant. However, a closer examination of each of the age groups shows that age differences were not monotonic in either of the two groups in that household socializing did not increase or decrease consistently with age. Thus age did not appear to be a useful predictor of household socializing time.

Age was also found to be a significant independent variable to household socializing in the U.S. sample. Household socializing increased with age until the age of 45–54. Similar to the mainland Chinese, the age group of 45–54 spent the least time with their family members. Such a finding suggests something of a midlife crisis that is common in Western societies. An obvious difference lies in the age group of 65–74 in the U.S., who reported spending the most time with their family members among the other age groups. Taken together, then, age per se is not a useful predictor of household socializing time in any of the three compared groups.

*Education* was found to be nonsignificantly correlated with household socializing in Hong Kong and America. However, it yielded a significant correlation with household socializing (.09, MCA adjusted correlation at the .05 level) in mainland China. Moreover, education displayed a monotonic relation in that it decreased from 11.3 hours for those with elementary school education, to 10.4 hours for those with middle school education, to 10 hours for those with high school education, to 8.7 hours for those with some college education. A minor exception was that it rose to 8.9 hours for those with college graduate and above education. Thus, education seems to be a useful predictor of household socializing only in the mainland Chinese sample.

Family *income*, like gender, was found to be nonsignificant in its relation with household socializing in mainland China, Hong Kong and America. Marital status, on the other hand, was found to be significantly correlated with household socializing in mainland China (.18, MCA adjusted correlation at the .05 level), Hong Kong (.16, MCA adjusted correlation at the .05 level), and America (.12, MCA adjusted correlation at the .05 level). It is not surprising that married or cohabited couples reported that they had more contact with household members than singles, widows and the divorced.

In terms of the major variable of interest, *Internet use* time, no significant correlation with household socializing was found in either the mainland Chinese (.04, N.S.) or the Hong Kong samples (0.5, N.S.). In contrast with their American counterparts, in which nonusers reported highest socializing time, it was the heaviest using (10+ hours) respondents in Hong Kong who reported spending the longest hours with their family members (14.5 hours per week). The time spent with family members decreased along with the decrease in time spent on the Internet: The moderate users (5.0–9.0 hours) spent 1.0 hour less than the heavy users group. Those who reported they spent

2.0–4.9 hours in Internet use spent 1.6 hours less than the moderate users. Finally, both the light users (0.1–1.9 hours) and nonusers spent 1.0 hour less than the previous group (2.0–4.9 hours). As such, a monotonic relationship did appear in the Hong Kong sample, despite the nonsignificant correlation found.

In contrast, the pattern of Internet use was not systematic in the mainland China sample group. Nonusers spent 9.9 hours per week with their household members; whereas those who reported spending 0.1–1.9 hours per week on the Internet reported the lowest household contact time of 8.1 hours, and those with 2.0–4.9 hours per week on the Internet had 9.9 hours of household contact time (the same as the nonusers). Moderately heavy Internet users (5.0–9.9 hours) reported the highest socializing time with their family members (10.3 hours per week), with heaviest users reporting 9.6 hours.

Both the mainland Chinese and Hong Kong samples displayed a different pattern in Internet use from that of their U.S. counterparts. In the U.S. sample, nonusers reported highest socializing time, with time spent on household socializing decreased as time spent on the Internet increased.

*Impact on Socializing with Friends:* Table 3 shows that the average estimates for time spent with friends were 6.2 and 11.1 hours per week for the Chinese in mainland and Hong Kong, respectively. In comparison, the U.S. sample reported spending 9.5 hours per week with their friends. All three samples reported spending less time with their friends than with family members. Among the three, the Hong Kong sample reported the highest socializing contact with their friends.

Of the five demographic characteristics examined, age stood out to be the strongest predictor of socialization with friends in both mainland China and Hong Kong. The MCA adjusted correlation (*eta* coefficient) between age and socialization with friends was .16 and .18 for the mainland China and Hong Kong samples, respectively, both statistically significant. Generally speaking, the younger a person is, the more likely the person socializes with friends.

In particular, those aged between 18 and 24 spent far more time socializing with their friends than any one else. The pattern largely holds in the U.S. sample as well.

Some differences emerged in terms of the relationship between the four other demographic variables and socialization with friends. Education, family income and marital status were not found to be correlated with socializing with friends in either mainland China and Hong Kong samples. In contrast, education and marital status were significantly correlated with friends' socializing in the U.S. samples). Gender was a significant correlate in the Hong Kong sample, in which men spent 2.4 more hours socializing with their friends than women ( $p < .02$ ), whereas there was virtually no difference between the sexes in either the mainland China or the U.S. samples.

Finally, Internet usage was found to be unrelated to socializing with friends, after adjustment for the five demographic variables, in all three China

**TABLE 3: DIFFERENCES IN FRIEND SOCIABILITY BY DEMOGRAPHICS AND INTERNET USE (MCA ADJUSTED)\***

	Mainland China (N = 1,798)	Hong Kong (N = 1,007)	U.S.# (N = 1,774)
TOTAL SAMPLE	6.2 Hours	11.5 Hours	9.5 Hours
<b>Age</b>			
18-24	2.8	6.1	2.4
25-34	1.5	-0.5	1.0
35-44	-0.6	0.2	-.2
45-54	0.0	-1.3	-1.9
55-64	-1.7	-3.9	-1.0
65-74	-1.7	-2.7	.4
Correlation	.16 --> .16 Sig.	.22 --> .18 Sig.	.15 --> .12 Sig.
<b>Education</b>			
Elementary School	1.0	1.8	
Middle School	0.1	-1.1	1.1
High School	0.2	-0.6	1.0
Some College	-0.4	-2.8	-.4
College Graduate & Above	-0.7	1.6	-1.2
Graduate School	-0.7	1.6	-1.3
Correlation	.03 --> .05 NS	.10 --> .09 NS	.09 --> .09 Sig.
<b>Family Income</b>			
Low	0.4	-0.6	-1.5
Medium Low	0.2	-0.6	.3
Medium High	-0.4	-0.2	-.2
High	0.0	-2.0	1.1
No Data		1.6	.7
Correlation	.03 --> .04 NS	.07 --> .07 NS	.10 --> .06 NS
<b>Marital Status</b>			
Married/Living together	0.0	-0.8	-1.2
Divorced	0.2	-1.6	1.2
Separated	0.2	-1.6	0
Widowed	0.2	-1.6	-.8
Single	0.0	2.0	2.8
Correlation	.11 --> .01 NS	.19 --> .09 NS	.16 --> .15 Sig.
<b>Sex</b>			
Male	0.2	1.2	.8
Female	-0.3	-1.2	-.6
Correlation	.03 --> .03 NS	.09 --> .08 Sig.	.07 --> .06 NS
<b>Internet Use</b>			
None	-0.2	0.1	.7
0.1-1.9 Hrs	-0.1	-1.1	.3
2.0-4.9 Hrs	0.7	0.0	-1.4
5.0-9.9 Hrs	0.5	1.5	-.1
10.0+ Hrs	0.6	-0.7	-.2
Correlation	.07 --> .04 NS	.10 --> .04 NS	.06 --> .06 NS

\* Entries are deviations from the total sample mean. Correlations are for before and after MCA adjustment. Sig. = Eta correlation is significant at .05 level after MCA adjustment vs. NS = Not Significant.

# Adapted from Cole and Robinson (2002).

samples. Nevertheless, it is interesting to note that the time spent socializing with friends increases as one's use of the Internet goes up in the mainland China sample (e.g., users spent about .8 hours more than nonusers on socializing with friends) but decreases in the U.S. sample (e.g., users spent about .8 or more hours less than nonusers). No such monotonic trend was present in the Hong Kong sample.

It should be reiterated that the findings are the net differences across levels of Internet use after the impact of the five demographic variables (especially age) are held constant. In the bivariate analysis between Internet use and socializing with friends in both Hong Kong and mainland China samples, heavy users reported significantly more time than light users socializing with friends; and the latter, in turn, reported more time than nonusers. However, the differences virtually disappeared after adjustment for age and other demographic variables, because young cohorts spent more time on both the Internet and socializing with friends than their old cohorts.

*Impact on Family Interactions:* Table 4 reports the MCA results of Family Interactions, which is a composite scale varying from 0 to 7 with 0 for the least active interaction and 7 for the most active interactions. Since this index was not employed in the U.S. sample, the analysis was only applied to the mainland China and Hong Kong samples. As shown in Table 4, the average estimates of days spent on family interactions were 3.6 and 3.1 days per week for the mainland China sample and the Hong Kong sample, respectively.

Marital status was found to be the strongest predictor of family interactions in both samples, with the MCA adjusted correlation (*Eta* coefficient) being .27 and .41, respectively. In general, the married respondents reported far more interactions with family members, about 1 point or more on a 7 point scale, than the single, widowed or divorced respondents.

Age was the second best predictor, with the MCA adjusted correlation being .11 and .17 (both significant) for the mainland China and Hong Kong samples, respectively. However, the impact of age on family interactions took an opposite direction in the two samples. The older cohorts reported more interactions with family members than the younger cohorts in the mainland China sample, except for the youngest cohort (of age between 18 and 24), whereas the older cohorts reported less interactions with family than the younger cohorts.

Education and gender also had a significant impact on family interactions. Interestingly, the relationship between education and family interactions was an inverted U-shape in both samples, with those with high school education reporting more family interaction than those with lower or higher levels of education. The relationship between gender and family interactions was also identical in the two samples, with women reporting more family interactions than men, as one might expect given the traditional socialization of women to be more family oriented (Shaver 1994).

**TABLE 4: DIFFERENCES IN FAMILY INTERACTIONS BY DEMOGRAPHICS AND INTERNET USE (MCA ADJUSTED)\***

	Mainland China (N = 1,798)	Hong Kong (N = 1,007)
TOTAL SAMPLE	3.6	3.1
<b>Age</b>		
18-24	0.0	0.4
25-34	-0.2	-0.2
35-44	-0.1	0.2
45-54	0.0	-0.1
55-64	0.3	-0.3
65-74	0.2	-0.4
Correlation	.21 --> .11 Sig.	.19 --> .17 Sig.
<b>Education</b>		
Elementary School	-0.1	-0.2
Middle School	0.1	-0.2
High School	0.1	0.3
Some College	-0.2	-0.1
College Graduate & Above	-0.1	0.0
Correlation	.12 --> .08 Sig.	.14 --> .14 Sig.
<b>Family Income</b>		
Low	-0.1	0.2
Medium Low	0.1	0.1
Medium High	0.0	-0.2
High	0.0	-0.1
No Data	NA	0.0
Correlation	.07 --> .04 NS	.09 --> .10 NS
<b>Marital Status</b>		
Married/Living together	0.2	0.4
Widow/Separated/Divorced	-0.6	-1.7
Single	-0.7	-0.8
Correlation	.29 --> .27 Sig.	.35 --> .41 Sig.
<b>Sex</b>		
Male	-0.1	-0.1
Female	0.1	0.1
Correlation	.08 --> .07 Sig.	.09 --> .07 Sig.
<b>Internet Use</b>		
None	0.0	0.0
0.1-1.9 Hrs	0.0	0.2
2.0-4.9 Hrs	0.0	-0.2
5.0-9.9 Hrs	0.0	-0.1
10.0+ Hrs	-0.1	0.1
Correlation	.12-.02 NS	.07-.07 NS

\* *Family Interactions* is a composite scale of four items (Cronbach's alpha = .69 for the mainland sample and .68 for the Hong Kong sample). The scale varies from 0 to 7, with 7 being interactions with family members seven days a week. The scale was not included in the UCLA study.

Again, the variable of the main interest—Internet use—showed no significant correlations with family interactions for both the mainland China and Hong Kong samples. In the mainland China sample, almost everyone, users or nonusers, reported exactly the same level of family interactions, except those who used the Internet most (10 hours or more per week), who reported slightly less family interaction. As for the Hong Kong sample, the relationship between Internet use and family interaction was neither significant nor consistent, with light users reporting slightly more, moderate users slightly less, and heavy users slightly more family interactions than nonusers.

## **DISCUSSION**

The main focus of the current study was on the impact of Internet use on sociability in mainland China and Hong Kong. The study was guided by the theoretical framework developed by Dutton, Rogers and Jun (1987) for research on home computing. This study attempts to shed some light on the diffusion, use and effects of the Internet using Zhu, Weaver, Lo, Chen and Wu's (1997) theory-driven approach to examine possible societal-level affects. The comparative approach was adopted following this procedure: (1) Two societal factors relevant to Internet development were postulated, namely, the techno-environment for Internet use and Internet penetration in the society. (2) Five possible outcomes (models), with suggested implications for theory or methodology, were offered. (3) The data from two China samples (Mainland China and Hong Kong) were compared between themselves and with parallel data from the UCLA study (Cole and Robinson 2002). Guided by these theoretical conceptualizations, findings from the present study were anticipated to generate certain theoretical implications.

The current study found no relation between Internet use and household socializing, socializing with friends and family interactions. This finding prevails in the mainland Chinese and Hong Kong samples, as well as Cole and Robinson's (2002) U.S. sample. Household socializing was found to be more influenced by age and marital status in all three groups. Moreover, education was found to predict household socializing in mainland China but not elsewhere. Socializing with friends was related to age in all three samples, and gender was also a predictor of socializing with friends for the Hong Kong sample. In addition to age, education and marital status were predictors of socializing with friends for the U.S. group. As for family interactions, age, education, marital status and gender were found to be significant predictors in both mainland China and Hong Kong.

The amount of time spent on face-to-face communication and interaction with family members, as well as face-to-face communication with friends, has no association with Internet use. The implication of this finding is that offline communication is stronger than online communication, in the sense that the former is unaffected by the latter. This may suggest that: (1) Offline

communication possesses some inherently distinctive features that are hard to replace with other modes of communication (e.g., online communication); (2) Online and offline are two “separate” worlds and individuals function independently between the two; (3) Socialization with “real” people, including family members and friends, constitutes an important part and need in one’s daily life.

Several studies have shown that online communication serves different purposes than offline communication. According to a study conducted by Zhu and He (2002b) in Hong Kong, users spend the largest amount of time on searching for work- or study-related information (200 minutes per week on average), followed by receiving/sending email messages (175 minutes), searching for personally interesting information (104 minutes), and reading online news (90 minutes). Another study conducted by Zhu *et al.* (2002a) in mainland China found that users spend the largest amount of their online time on search for work- or study-related information, followed by reading online news and participating in online chat or discussion. These two studies suggest that Internet use has gradually been used more for functional purposes and leisure activities (even though not necessarily taking place in one’s private leisure time). This implies the different functions that offline and online communications serve.

Studies on the affects of the Internet have yielded contradictory findings. Whereas Kraut *et al.* (1998) found that increased Internet use was associated with less family communication, smaller social circles, more loneliness, and more depression, other studies found no association at all or the opposite—including Kraut *et al.*’s (2002) follow-up study. The current study, as well as Cole and Robinson (2002) and Yamauchi and Coget (2002) suggest a convergent finding that there is little relation between Internet use and antisocial tendencies. One possible reason could be that at the time when Kraut *et al.* (1998) conducted their study, the Internet was still at an early penetration level in the U.S. that aroused people’s excitement to adopt and use. As the excitement for the “new toy” leveled off in the following years, people resumed their normal routines. Today, the Internet serves more of a functional purpose and is considered one of the activities one could choose in one’s private leisure time.

These insignificant relations between Internet use and sociability do not invalidate applicability of the theoretical framework. These analyses examined a small part of the whole picture. There are sundry effects one could explore in the dimensions of knowledge, attitudes, values and behavior. Indeed Dutton *et al.*’s (1987) model has provided a valuable way to (1) conceptualize the whole diffusion process of the Internet; (2) examine what else may have been missed; and (3) contemplate what to study in the process in the future. Use of the Internet, for example, is suggested in the model to include the dimensions of amount of time, content preferred, channels visited, and language of the sites—and not just amount of time devoted to Internet use. The inclusion of other dimensions may yield different findings.

According to the conceptual scheme presented in Table 1, one might conclude that at least at this stage, the two societal variables of political-techno environment for Internet use and Internet penetration, have no impact on the Internet diffusion process. Despite the lack of significant impact of societal influences, this comparative approach is needed to go beyond simple descriptive differences across societies (Zhu *et al.* 1997).

An alternative explanation to the nonsignificant societal factors could be that the finding of null effects is due to poorly designed measurement that is insensitive to societal differences (Zhu *et al.* 1997). Two shortcomings in measurement need to be mentioned:

Firstly, "sociability" was defined as time spent in socializing with family members and friends as well as interacting with household members. While quantity of contact was considered, the quality of the socialization and interaction was overlooked. Also, there exists a need to have a common understanding of "sociability," which could include time spent with family members and friends, antisocial psychological characteristics, and ability to build/maintain quality of relationship, among others. As December (1996, 3) has stated, "Without a common framework for units of analysis, definitions of what is being studied on the Internet can be clouded by a poor definition of the research setting, making cross-study (or even intra-study) comparisons difficult."

Secondly, time spent on the Internet was conceptualized as the total amount of time one spent at work, at home, and in other settings. Internet use at work is functional and involuntary in nature, whereas Internet use at home could be functional, entertaining and mostly likely voluntary. Thus, the inclusion of Internet use at work might have offset any effects.

Thirdly, the present study relied on subjects' self-reported time on Internet use and socializing that open problems of: (1) respondent perceptions, (2) social desirability or (3) wishful thinking/psychological compensation. More detailed measurement techniques, such as the time diary (Robinson 1977, 1999) could provide more accurate and richer data for analysis.

Finally, given the relatively short history of the Internet (e.g., compared to TV), it may be too early to detect any long-term changes brought on by the new media technology. It may be even unfair to conclude at this stage its social impact on individuals and societies. After all, it took 20 years or so for scholars to establish the cultivation theory after the first TV set appeared in the 1940s.

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