

This article was downloaded by: [Sun Yat-Sen University]

On: 02 February 2012, At: 03:38

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



International Journal of Human-Computer Interaction

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/hihc20>

Understanding User Satisfaction With Instant Messaging: An Empirical Survey Study

Wei Wang^a, JJ Po-An Hsieh^b & Baoxiang Song^c

^a Jinan University, Guangdong Province, P.R. China

^b The Hong Kong Polytechnic University, Kowloon, Hong Kong

^c Nanjing University of Chinese Medicine, Nanjing, P.R. China

Available online: 24 Jun 2011

To cite this article: Wei Wang, JJ Po-An Hsieh & Baoxiang Song (2012): Understanding User Satisfaction With Instant Messaging: An Empirical Survey Study, *International Journal of Human-Computer Interaction*, 28:3, 153-162

To link to this article: <http://dx.doi.org/10.1080/10447318.2011.568893>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Understanding User Satisfaction With Instant Messaging: An Empirical Survey Study

Wei Wang¹, JJ Po-An Hsieh², and Baoxiang Song³

¹Jinan University, Guangdong Province, P.R. China

²The Hong Kong Polytechnic University, Kowloon, Hong Kong

³Nanjing University of Chinese Medicine, Nanjing, P.R. China

The current article examines user satisfaction with instant messaging in building and maintaining social relationships with friends, family members, and others. The research model integrates motivation theory with media capacity theories to explain how the attributes of media capacity (e.g., social presence and media richness) and users' intrinsic and extrinsic motivations toward using instant messaging influence user satisfaction. Data were collected from a sample of 247 Chinese university students via an online survey. The results suggest that perceived enjoyment, perceived social presence, and perceived usefulness are key to user satisfaction. Perceived social presence and perceived media richness are positively associated with perceived enjoyment. It was also found that perceived enjoyment, perceived social presence, and perceived media richness have significant effects on perceived usefulness. Of interest, perceived enjoyment and perceived social presence have stronger effects on user satisfaction than perceived usefulness.

1. INTRODUCTION

According to Maslow (1943), people have five hierarchical levels of needs: physiological needs; safety needs; needs for love, affection, and belongingness; needs for esteem; and needs for self-actualization. Existence needs have priority over relatedness needs, which, in turn, have priority over growth needs. Once the existence needs are fulfilled, people try to satisfy their relatedness needs by creating interpersonal relationships. In the past, interpersonal relationships have been achieved using face-to-face communications or by using other mediated functional alternatives such as the telephone or the exchange

The work described in this article was supported by a grant from the Natural Science Foundation of China (No. 70971081/G011201) and a grant from the Natural Science Foundation of Guangdong Province (No. 9451503101003590). We thank the anonymous reviewers for their helpful comments on the earlier version of this article.

Address correspondence to Wei Wang, Management School, Jinan University, 601 Huangpu Avenue W, Guangzhou City, Guangdong Province, 510632 P.R. China. E-mail: wangw@jnu.edu.cn

of letters. The Internet, as an efficient channel for interpersonal communication, has revolutionized the way people communicate. Communication tools, such as e-mail, voice mail, and instant messaging (IM), have become popular in people's work environments and daily lives. E-mail was the dominant Internet communication medium in the past several years; however, in recent years, interactive online communication, especially IM, has been widely diffused among Internet users. For instance, the number of Chinese Internet users exceeded 298 million in 2008. Among them, more than 224 million (almost 74.7%) are IM users (CNNIC, 2009). Moreover, a 2007 report by the Horizon Research Consultancy Group indicated that IM use had surpassed e-mail use in China. IM is currently the third most popular communication tool, preceded only by mobile phones and landline phones. Millions of Internet users are using IM with their friends and families for online social communication to develop and maintain their relationships.

IM refers to an Internet-based application that provides real-time communication between people. IM created the possibility of real-time, text-based communication between two or more participants over the Internet. Currently, IM has some additional features such as allowing IM users to communicate with each other via a combination of text messages, voice, and video. In general, today's IM has some unique features: presence awareness, "pop-up" recipient notification, silent interactivity, within-medium polychronic communication (participation in multiple concurrent conversations), and ephemeral transcripts (the ephemeral character of the interaction transcript) (Li, Chau, & Lou, 2005; Qiu & Benbasat, 2005). These features make IM a better substitute for actual face-to-face communication than any other technology currently in the market.

In the initial stages of Internet diffusion, increasing numbers of adopters relied more heavily on Internet communications, which was very efficient but also resulted in less actual face-to-face or telephone communication. As a result, some people began to see Internet communications as something that isolated

them from their social contacts. The emergence of IM enabled people to communicate in a way that is more similar to face-to-face communication, thus solving some of the communication problems for geographically dispersed people.

The wide diffusion of Internet communication technologies has attracted the attention of many researchers. Although most existing studies focus on the use of these technologies in organizations (Huang, Hung, & Yen, 2007; Kettinger & Grover, 1997), relatively less attention has been paid to their use in the voluntary social contexts outside the workplace. Most IM services are free and easy to use, leading to a high level of IM adoption (CNNIC, 2009). Because many people use IM, the key issue for IM designers becomes how to motivate users to continue or increase their use of a particular IM product. The information system (IS) continuance model (Bhattacharjee, 2001) suggests that user satisfaction is the dominant factor explaining users' continuous usage of a given technology. This study also focuses on user satisfaction as the key dependent variable to determine the extent to which it is critical for users' continued IM use.

This research examines user satisfaction in a social context. Its main focus is on the social use of IM in building and maintaining social relationships among friends, family members, and others rather than on its organizational use among employees and customers. Specifically, the research explains how media capacity attributes, such as social presence, media richness, and users' perceptions of IM, influence user satisfaction of IM use.

2. THEORETICAL FOUNDATIONS AND RESEARCH HYPOTHESES

The research foundations for this study include social presence theory and media richness theory, which are related to media capacity, motivation theory, and the IS continuance model. Social presence theory (Short, Williams, & Christie, 1976) and media richness theory (Daft & Lengel, 1984) have long been used to explain users' media choices. These theories are based on the premise that media have different capacities to carry interpersonal communicative cues. In addition, motivation theory (Davis, Bagozzi, & Warshaw, 1992) proposes that intrinsic and extrinsic motivations determine individuals' information technology usage behaviors. Perceived enjoyment (PE) and perceived usefulness (PU) have been, respectively, identified as the representative intrinsic and extrinsic motivators for individuals' Internet use (e.g., Li et al., 2005; Teo, Lim, & Lai, 1999). The IS continuance model posits that users' continuance intentions are based on their satisfaction with prior use and PU, and user satisfaction is the most critical determinant in influencing IS continuance intention (Bhattacharjee, 2001).

2.1. Social Presence Theory

According to social presence theory (Short et al., 1976), *social presence* refers to extent to which a person is aware of another person in a communication interaction. Media differ in their abilities to convey the psychological perception that

other people are physically present. Communication media can thus be classified along a one-dimensional continuum of social presence, where communication is effective if the medium has sufficient social presence required for interpersonal involvement in a task. In general, a face-to-face medium is considered to have the most social presence, whereas written and text-based communications have the least. Thus, videoconferencing has greater social presence than e-mail, and media with high social presence contribute to building close interpersonal relationships.

2.2. Media Richness Theory

Media richness theory (Daft & Lengel, 1984), also referred to as information richness theory, provides a framework that describes a communication medium according to its ability to accurately reproduce the information sent over it. Information richness is defined as the amount of information a communication medium can convey, within a time interval, to change the receiver's understanding of a concept or issue (Daft & Lengel, 1984). Communication media vary in their abilities to carry rich information and facilitate understanding. A medium is considered to be richer if communication can clarify ambiguous issues in a way that promotes understanding in a timely manner. By contrast, a medium is regarded as less rich if communication takes a longer time to convey understanding. In terms of quantity, rich media carry more information, whereas lean media carry less information. In general, oral media are richer than written media, and synchronous media are generally richer than asynchronous media (Markus, 1994). Media richness theory has been applied to explain media choice and media use (Dennis & Kinney, 1998).

2.3. Motivation Theory

Motivation theory describes why and how human behaviors are activated and directed. There are in general two different categories of motivation: intrinsic motivation and extrinsic motivation. Intrinsic motivation is defined as the perception that users will want to perform an activity for no external reason other than for just performing the activity. Extrinsic motivation drives individuals when they want to achieve valued outcomes, such as improved job performance, pay, or promotions (Davis et al., 1992). Motivation theory suggests that both intrinsic and extrinsic motivations are factors in driving people to dedicate both their time and effort to use a given technology. The most representative intrinsic motivator that simulates IS use is PE, which characterizes the hedonic aspect of using a technology. The most representative extrinsic motivator is PU, which describes the instrumental aspect of technology use.

2.4. IS Continuance Model

It is widely recognized that once individuals adopt an IS, whether they continuously use the IS has profound implications with regard to the ultimate success of the system (Bhattacharjee,

2001; Karahanna, Straub, & Chervany, 1999). This is the reason why the IS continuance model (Bhattacharjee, 2001) has been widely applied to study postadoptive behaviors (e.g., Hong, Thong, & Tam, 2006; Hsieh & Wang, 2007). The IS continuance model posits that a user's intention to continue using a technology is primarily determined by his or her satisfaction with previous use and PU, and satisfaction is the predominant predictor in explaining the continued use of an IS. Furthermore, user satisfaction is positively influenced by the PU usefulness of the IS.

2.5. Research Model and Research Hypotheses

We choose user satisfaction as the core dependent variable in this study because of the critical role of user satisfaction in understanding continued IS use. The IS continuance model posits that a user's PU directly affects his or her satisfaction with a technology and IS continuance intention (Bhattacharjee, 2001). In addition, prior studies have found that PE is the dominant factor explaining individuals' adoption of communication technologies such as IM (e.g., Li et al., 2005). Therefore, it is important to integrate instrumental factors (i.e., PU) and hedonic factors (i.e., PE) when studying communication technologies.

In addition, IM is an interactive online global communication tool that helps people easily communicate in real time with friends, colleagues, and even strangers. IM is now a better alternative than other communication technologies when face-to-face communication is impossible (Gay, Stefanone, Grace-Martin, & Hembrooke, 2001). Unlike e-mail, IM's presence awareness feature allows a user to quickly determine whether the recipient is available. Thus, IM has a quicker response time than e-mail. In addition, due to the integration of other media features, IM has a high degree of perceived social presence (PSP) and perceived media richness (PMR). As such, it is important to incorporate media capacity theories (i.e., social presence and media richness theories) to identify the important factors explaining user satisfaction with IM use. The research model incorporating these relationships is illustrated in Figure 1. Table 1 summarizes the hypotheses in this study.

The most widely accepted definition of PU is related to job performance or business utility in a work context (Davis, Bagozzi, & Warshaw, 1989). However, in the present study, PU captures the instrumentality of a communication technology in social settings. Thus, PU is defined as users' instrumental belief of whether using the communication technology is useful to build and maintain interpersonal relationships in a voluntary social context (Li et al., 2005). An IM technology that is effective in providing instant feedback and conveying multiple cues is generally perceived as very useful for interpersonal communication (Fulk, 1993; Soe & Markus, 1993), thereby leading to higher levels of user satisfaction. Previous studies have revealed that PU impacts individuals' affective feelings of technology use (Davis et al., 1989; Karahanna et al., 1999). Moreover,

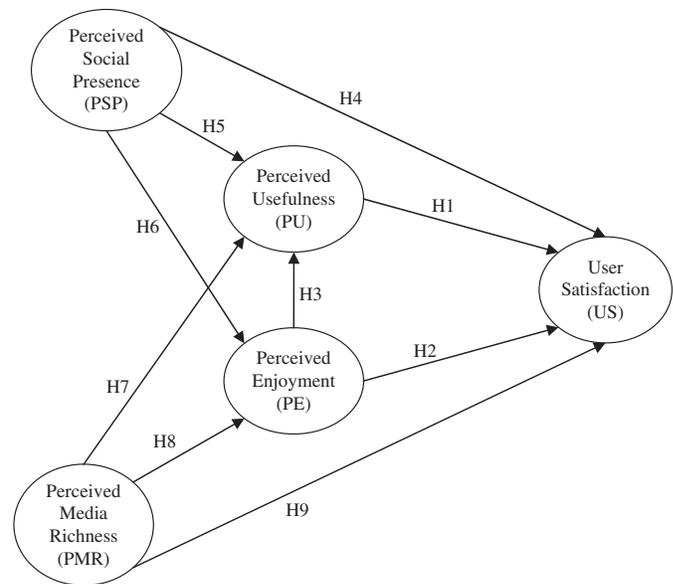


FIG. 1. Research model.

Bhattacharjee (2001) also found a positive relationship between PU and user satisfaction. Based on the aforementioned discussion, we propose the following hypothesis:

H1: Perceived usefulness is positively associated with user satisfaction.

Individual IS use is also driven by such intrinsic motivator as PE in nonworkplace settings (Hsieh, Rai, & Keil, 2008; Van de Heijden, 2004). PE is defined as the perception of fun and pleasure inherent in using a communication technology to develop and maintain interpersonal relationships (Davis et al., 1992; Li et al., 2005). Interpersonal communication typically involves both instrumental and hedonic purposes in voluntary social contexts. When users perceive their IM use to be enjoyable, their IM use fulfills their hedonic needs, thereby increasing their satisfaction with the technology. As such,

H2: Perceived enjoyment is positively associated with user satisfaction.

The joyful feeling during the actual interpersonal communication is an important element, which establishes and fosters interpersonal relationships (Li et al., 2005). Thus, the enjoyable feeling derived from IM usage helps make users feel that IM is useful for building and maintaining their interpersonal communications, suggesting a positive link from PE to PU. Prior studies (e.g., Li et al., 2005; Venkatesh, 2000) also found that intrinsic motivators such as PE and playfulness affect extrinsic motivators such as perceived usefulness. Thus,

H3: Perceived enjoyment is positively associated with perceived usefulness.

TABLE 1
Theory and hypothesis

Theory	Hypothesis
IS continuance model	H1: Perceived usefulness is positively associated with user satisfaction.
IS continuance model motivation theory	H2: Perceived enjoyment is positively associated with user satisfaction.
Motivation theory	H3: Perceived enjoyment is positively associated with perceived usefulness.
Social presence theory	H4: Perceived social presence is positively associated with user satisfaction. H5: Perceived social presence is positively associated with perceived usefulness. H6: Perceived social presence is positively associated with perceived enjoyment.
Media richness theory	H7: Perceived media richness is positively associated with perceived usefulness. H8: Perceived media richness is positively associated with perceived enjoyment. H9: Perceived media richness is positively associated with user satisfaction.

Note. IS = information systems.

Social presence theory posits that media are different in terms of their capabilities to psychologically construct the perception that other people are physically present (Short et al., 1976). Using a medium that is higher in social presence is beneficial for social tasks such as building personal relationships. Thus, a medium with a higher level of social presence is more likely to be perceived as being useful for building and maintaining social relationships.

Social presence can also be considered a function of a medium's capability to deliver both verbal and nonverbal cues (Chen, Yen, & Huang, 2004). IM and e-mail are both primarily text-based technologies. Compared with e-mail, IM adds richer features, such as real-time communication, presence awareness, and graphic emotional icons. These features make this mode of communication more enjoyable and pleasurable, and users are more likely to have higher levels of satisfaction with IM. Based on the aforementioned discussion, we propose the following:

- H4: Perceived social presence is positively associated with user satisfaction.
H5: Perceived social presence is positively associated with perceived usefulness.
H6: Perceived social presence is positively associated with perceived enjoyment.

Media richness theory claims that richness is the factor that is most likely to affect a user's perception of a media's usefulness (Daft & Lengel, 1986). Media richness is reflected through a combination of four criteria: speed of communication, multiple cues, language variety, and degree of personalization. E-mail is typically considered low in media richness, whereas a face-to-face meeting is high in media richness. Compared with e-mail and face-to-face meeting, IM is a communication medium that falls in the middle of the richness scale. IM exhibits many interactive features that are closer to face-to-face meetings, but it also exhibits some features, such as text exchange, that are similar to leaner media (e.g., e-mail) on the media richness scale. Thus, IM delivers a combination of different media each with different richness features. The feature combinations of IM

are more likely to be associated with users' perceptions of the medium's usefulness and are more likely to satisfy their communication needs compared with other media. Moreover, as a good substitute for face-to-face communication, IM exhibits high perceived media richness and clearly a great deal of flexibility. IM's rich features, particularly its text-based exchange and voice communication capabilities, make the communication process more enjoyable for individual users. Therefore, we propose the following hypotheses:

- H7: Perceived media richness is positively associated with perceived usefulness.
H8: Perceived media richness is positively associated with perceived enjoyment.
H9: Perceived media richness is positively associated with user satisfaction.

3. RESEARCH METHOD

3.1. Measures

The five constructs in the research model were measured using scales adapted from prior studies on the investigative context of IM use. We adapted the items for user satisfaction and PU from Bhattacharjee (2001), the items for PE from Davis et al. (1992) and Venkatesh (2000), items for PSP from Short et al. (1976) and Yoo and Alavi (2001), and the items for PMR from Carlson and Zmud (1999). All of the items were measured on 5-point Likert scales ranging from *strongly disagree* to *strongly agree*. The appendix lists the final items used in the study.

3.2. Data Collection

The questionnaire was translated from English to Chinese and then back-translated from Chinese to English by certified professional translators (Brislin, Lonner, & Thorndike, 1973) to ensure the integrity of the constructs. The Chinese language version of the questionnaire was distributed to and examined by three professors and 15 undergraduate students at a public university in China to ensure that their understanding of

TABLE 2
Sample demographics

IM users	Category	%
Gender	Male	40.9
	Female	59.1
Age	18–22 years old	77.7
	23–29 years old	22.3
Experience with IM	<1 year	2.8
	1–3 years	38.5
	4–6 years	40.9
	7–9 years	16.2
	>9 years	1.6

Note. IM = instant messaging.

the meaning of the items was consistent with the constructs being used in this research. Some minor modifications were made based on their feedback as well as from examining the back translation. The revised questionnaire was then used for the official online survey.

We used an online survey to collect data. The respondents were undergraduate and graduate students in business courses taught by the first and third authors in the business school of a public university in China. The online survey was an ideal way to collect data from students because of their frequent use of the Internet for their assignments. Students are also ideal subjects for this research because they are a prime target segment of current high users of IM and the degree to which they are likely to remain loyal users in the future is extremely important to the commercial viability of IM. The first and third authors informed their students about the survey during class, and of a total of 465 invited students, 247 completed questionnaires, resulting in an effective response rate of 53.1%. Participation was voluntary and anonymous. Table 2 presents the demographic characteristics of the research subjects.

4. DATA ANALYSIS AND RESULTS

Structural equation modeling (SEM) was applied to analyze the data, using AMOS 17.0. SEM is a multivariate technique that combines aspects of multiple regression and factor analysis to estimate a series of interrelated dependence relationships simultaneously (Hair, Anderson, Tatham, & Black, 1998). First, SEM assesses the measurement model to analyze the relationships between the latent constructs and their associated items. Then, SEM assesses the structural model to analyze the relationships between the various latent variables. Before doing analysis using SEM, we conduct tests for normality. We found that the skew values of all variables are smaller than 3, and the kurtosis values of all variables are smaller than 8. The multivariate kurtosis value is 2.60, and critical ration (c.r.) is 1.98. Therefore, a multivariate normality distribution was achieved.

4.1. Measurement Model

The measurement model was assessed using confirmatory factor analysis (Hair et al., 1998). One item of perceived social presence and one item of perceived media richness were dropped because of low loadings. All fit indices (see Table 3) meet the commonly applied thresholds (e.g., Chau, 1997; Gefen & Straub, 2000). Table 4 presents the descriptive statistics of the constructs.

We further evaluated internal consistency, convergent validity, and discriminant validity by examining the Cronbach's alpha, composite reliability, and average variance extracted (AVE) of each construct (see Table 5). The values of Cronbach's alpha and composite reliabilities were all higher than the criterion 0.70 (Nunnally, 1978; Nunnally & Bernstein, 1994), thereby suggesting an adequate level of internal reliability. The value of AVE of each construct was all above 0.50 (see Table 5), and the square root of AVE of a construct is greater than its correlations with other constructs, thereby supporting discriminant validity (Fornell & Larcker, 1981; see Table 6). The previous results collectively suggest that the measurement model is appropriate.

TABLE 3
Fit indices of measurement model

Goodness of fit indices	Measurement model	Desired levels
χ^2/df	1.99	<3.0
CFI	0.97	>0.90
TLI	0.96	>0.90
RMSEA	0.06	0.05–0.08
Standardized RMR	0.04	<0.05
GFI	0.91	>0.90
AGFI	0.87	>0.80
No. of latent variables	5	
Total no. of items	17	

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; RMR = root mean square residual; GFI = goodness-of-fit index; AGFI = adjusted GFI.

TABLE 4
Descriptive statistics

Construct	<i>M</i>	<i>SD</i>
Perceived social presence	3.76	0.72
Perceived media richness	4.17	0.74
Perceived enjoyment	3.99	0.78
Perceived usefulness	3.95	0.74
User satisfaction	3.83	0.78

Note. All constructs are 5-point scales with the following anchors: 1 (*strongly disagree*), 3 (*neutral*), 5 (*strongly agree*).

TABLE 5
Confirmatory factor analysis

Latent construct	Indicator	Standard loading	Cronbach's α	Composite reliability	Average variance extracted
Perceived social presence (PSP)	PSP1	0.93***	0.90	0.90	0.74
	PSP2	0.89***			
	PSP4	0.76***			
Perceived media richness (PMR)	PMR2	0.53***	0.78	0.80	0.59
	PMR3	0.82***			
	PMR4	0.90***			
Perceived enjoyment (PE)	PE1	0.88***	0.93	0.93	0.82
	PE2	0.94***			
	PE3	0.90***			
Perceived usefulness (PU)	PU1	0.87***	0.92	0.93	0.76
	PU2	0.91***			
	PU3	0.90***			
	PU4	0.80***			
User satisfaction (US)	US1	0.81***	0.93	0.93	0.76
	US2	0.92***			
	US3	0.90***			
	US4	0.85***			

*** $p < .01$.

TABLE 6
Discriminant validity

Construct	PSP	PMR	PE	PU	US
PSP	0.86				
PMR	0.47	0.77			
PE	0.77	0.47	0.91		
PU	0.62	0.50	0.63	0.87	
US	0.75	0.40	0.79	0.62	0.87

Note. The bold numbers on the diagonal are the square root of the variance shared between the constructs and their measures. Off-diagonal elements are correlations among constructs. For discriminant validity, diagonal elements should be larger than off-diagonal elements. PSP = perceived social presence; PMR = perceived media richness; PE = perceived enjoyment; PU = perceived usefulness; US = user satisfaction.

TABLE 7
Fit indices of structural model

GFI	Structural model	Desired levels
χ^2/df	2.07	<3.0
CFI	0.97	>0.90
TLI	0.96	>0.90
RMSEA	0.07	0.05–0.08
Standardized RMR	0.04	<0.05
GFI	0.90	>0.90
AGFI	0.86	>0.80
No. of latent variables	5	
Total no. of items	17	

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root mean square error of approximation; RMR = root mean square residual; GFI = goodness-of-fit index; AGFI = adjusted GFI.

4.2. Structural Model

Following the establishment of the measurement model, we move on to the structural model. The overall fit and the explanatory power of the research model were examined, and the results are shown in Table 7 and Figure 2. The overall goodness-of-fit was examined against the following six common fit measures: chi-square/degree of freedom, goodness-of-fit index, adjusted goodness-of-fit index, comparative fit index, standardized root mean square residual, and root mean square error of approximation. The results in Table 7 suggest a good fit between the structural model and the data.

Figure 2 illustrates the path coefficients and explanatory power for the structural model. Eight of the nine proposed hypotheses were supported. PU (H1; $\beta = 0.15$), PE (H2; $\beta = 0.48$), and PSP (H4; $\beta = 0.30$) all had significant effects on user satisfaction, explaining 69% of its variance. Contrary to our expectation, PMR had no statistically significant effect on user satisfaction, contrary to the relationship proposed in H9.

The results also show that PE ($\beta = 0.30$), PSP ($\beta = 0.29$), and PMR ($\beta = 0.22$) had statistically significant effects on PU, explaining 48% of its variance. H3, H5, and H7 were thus

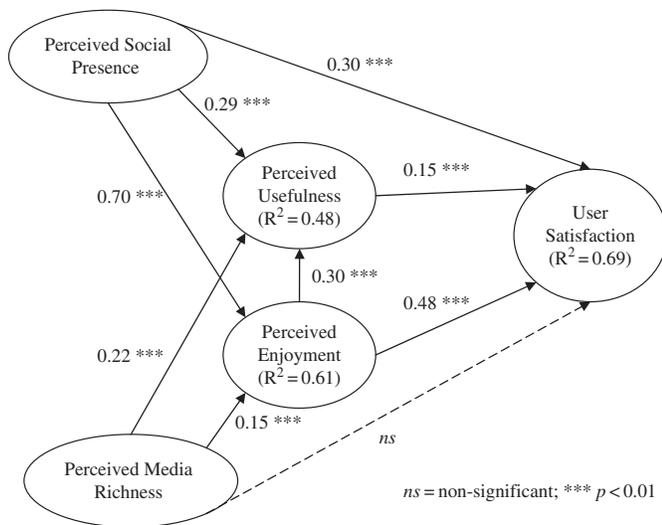


FIG. 2. Structural equation model.

supported. Finally, PSP ($\beta = 0.70$) and PMR ($\beta = 0.15$) had significant effects on PE, explaining 61% of its variance; H6 and H8 were also supported.

5. DISCUSSION

This study seeks to provide a research model to explain user satisfaction with IM use in voluntary social contexts. The results lend support to eight of the nine proposed links. Specifically, PE, PSP, and PU collectively explained 69% of the variance in user satisfaction, which is much higher than 33% explained in Bhattacharjee's (2001) IS continuance model. In Bhattacharjee's research, there are only four constructs with 14 items and 122 subjects, whereas this article has five constructs with 19 items and 247 subjects. Bhattacharjee's smaller sample and shorter questionnaire could account for his weaker findings. The addition of PE and PSP in this article could be another important reason for the enhancement of the explanatory power. Moreover, we found that PU ($\beta = 0.15$) had a weaker power than PE ($\beta = 0.48$) and PSP ($\beta = 0.30$) in explaining user satisfaction. This differential effect may be attributed to the technology under investigation in this study. Specifically, IM is a medium that is mainly used for interpersonal communication in social settings. Thus, IM users are more likely to be affected by the hedonic aspects of the technology and by their perceived interpersonal involvement in the communication process rather than by its PU.

In addition, media choice theory and social presence theory provide additional insights for explaining PU and PE with regard to IM use. In particular, PSP and PMR collectively explained 61% of the variance in PE, with PSP being the dominant variable in shaping users' perception of enjoyment. This finding suggests that users are likely to be attracted to IM use based on their perceptions of their partners' physical presence,

which can strengthen their intrinsic motivation toward using the communication tool.

PE, together with PSP and PMR, explained 48% of the variance in PU. IM's social nature enables an individual user to build and maintain interpersonal relationships with others in real time, which is very different from IS in workplace settings (e.g., ERP systems). However, PU focused more on the instrumental effectiveness of IM users rather than the social nature of IM. As such, we found that the users' perceptions of the medium's capabilities, in shaping social presence and conveying media richness, and hedonic utility jointly informed users' perceived usefulness of IM.

Contrary to our hypothesis, PMR did not significantly impact user satisfaction. The effect of PMR on user satisfaction was mediated by PE and PU. We noted that three out of four items for PMR essentially pertain to increased capabilities or functionalities of the IM program. It is well known that users usually use only a very small percentage of all available program capabilities. Greater program features being added on do not necessarily lead to more satisfaction. In fact, these features may complicate human-communication interaction to the point that satisfaction declines. Therefore, one explanation for the lack of support is because media richness largely depended upon whether there were additional program features/functions/options for the users, and such things are far less important to users than how well the IM is designed for easy or intuitive use.

On the other hand, users often use different communication media to create a social or working relationship. For example, students may like to communicate with their teachers via e-mail rather than through an IM service because the relationship between teachers and students is a working, not a social, relationship. A working relationship refers to an interpersonal relationship that is task based, nontrivial, and of continuing duration (Gabarro, 1990). Such a relationship is developed upon the shared goal of task achievement. Scheduled and formal communication is often used for a working relationship, whereas spontaneous and informal communication is widely used for a social relationship. In recent years, e-mail has gradually become a formal communication (Lantz, 2003; Renaud, Ramsay, & Hair, 2006), whereas IM is still a representative of informal communication. This may be another reason why PMR did not show a significant direct effect on user satisfaction in this study. Future research is needed to investigate this effect.

5.1. Implications for Research

The present study created a research model for user satisfaction with IM use by incorporating the motivational model with media capacity theories. Our theoretical integration has provided a good explanation of user satisfaction with IM use (69%). We found that PE, social presence, and PU were significant determinants of user satisfaction with IM in the postadoption stage. Our user satisfaction with IM use research

model provides an important perspective for future studies of computer-mediated communication technologies.

The causal link between PU and user satisfaction was verified in this study, which is similar to the research results of the IS continuance model (Bhattacharjee, 2001). In this respect, the present study extends the generalizability of the PU–Satisfaction link in the IS continuance model to a broader set of information technologies. The present study also found that PE, compared to PU, is a stronger determinant for user satisfaction with IM in the voluntary social contexts. Future research may consider including intrinsic motivators, such as PE, as part of the IS continuance model, especially for information technologies with strong relationship development and maintenance purposes.

The effects of intrinsic motivation and extrinsic motivation on users' technology usage intentions and behaviors have been supported in prior research (Davis et al., 1992; Li et al., 2005). Our study suggested that intrinsic and extrinsic motivations also affect the formation of users' affective feeling (i.e., satisfaction). The identified effects of intrinsic and extrinsic motivations on user satisfaction warrant further investigation in terms of both technology adoption and postadoption behaviors.

We also found that the effect of PU assumes a minor role during the postadoption stage, which is consistent with some prior research (Hong et al., 2006; Hsieh & Wang, 2007). Our focus was on IM's social communication to maintain interpersonal relationships instead of its ability to enhance users' work performance. We encourage interested scholars to further explore how IM use is carried out in workplace settings and how IM use influences employees' performance.

5.2. Implications for Practice

IM has become increasingly prevalent in social life. However, IM use in today's workplace is still a heated topic. Many researchers have validated that the IM can develop friendship by devising their own relationship strategies in computer-mediated communication to deliver social and emotional cues (Parks & Floyd, 1996; Walther, 1992). However, working relationships share only some characteristics with such relationships (Cho, Trier, & Kim, 2005). Some work organizations prohibit their employees from using IM in the workplace because people have a general perception that IM is used mainly for socializing, not for task-related purposes. For example, in many organizations, IM is referred to as interruption management instead of instant messaging (Garrett & Danziger, 2008). One study found that employees were interrupted by an IM every 11 min in the workplace and that 57% of these interruptions were unrelated to their tasks at hand (Mark, Gonzáles, & Harris, 2005). Whereas some researchers have suggested that IM contributes to an increase in task interruption (Czerwinski, Cutrell, & Horvitz, 2000a, 2000b), others have argued that strategic use of IM can actually reduce interruption (Garrett & Danziger, 2008). In addition, effective working relationships

are conducive to employees' task accomplishment. Despite the potential for IM to be used to maintain work relationships in an organization, a great deal of uncertainty still exists when an individual attempts to develop a working relationship with his or her partner in an organization. Thus, an important study for both theory and practice is to investigate how employees' IM use affects their work performance and how managers can design suitable policies and regulations in organizations to ensure that employees use IM appropriately.

From the perspective of IM service providers, the significant effects of PE, PSP, and PU on user satisfaction suggest that the hedonic outcomes, presence awareness, and instrumental utility of the communication technology must be properly assessed. The strong effect of PE on user satisfaction suggests that the pleasure and enjoyment of IM is the critical satisfaction driver in the postadoption stage. The enjoyment aspect of IM could come from IM's ability to show smiley faces, avatars, icons, and other interactive features. Given their importance to user satisfaction, these interactive features should be strengthened and kept updated frequently. Therefore, IM service providers must continuously explore design methods to improve the entertainment aspects of IM use.

Finally, IM often shows a "pop-up" window for recipient notification and presence awareness, which is critical to the formation of user satisfaction in the postadoption stage. Thus, IM designers should further develop IM technology while keeping its media capabilities in mind, especially the features related to social presence.

5.3. Limitations

This research has several limitations, as is the case with most empirical research. First, students in this study might have used different IM tools from different service providers. Among the research subjects, QQ, Fetion, and MSN were the most popular IM tools. It is dubious whether these tools may differ in their key features so as to compromise the research findings in this study. To address this concern, we compared these tools and found no obvious differences in terms of their core features. Future research should compare the adopted IM programs to differentiate their features and functions in details.

Second, the data were collected from university students, and thus they may not fully capture the behavioral patterns of users in other age groups or contexts. Cautions should be exercised when generalizing our findings to other groups (e.g., the senior) or other contexts (e.g., workplace settings).

Third, the sampled subjects are students at a business school from the same university in China. Because they frequently meet in class or on campus, they may frequently communicate with each other in a face-to-face channel as opposed to through IM only. Compared with the face-to-face communication, IM is lower in perceived media richness (Cameron & Webster, 2005). Therefore, it may not be surprising that users' perceived media richness of IM did not show a direct effect on users' satisfaction with prior use.

Fourth, an IM tool is a computer-mediated communication technology, and users' continuous use of IM, as compared to IS in organizations, may mostly depend on their habits (Limayem, Hirt, & Cheung, 2007) and satisfaction (Bhattacharjee, 2001), rather than on their continuous intentions. Future research should examine users' habits and their relationship with user satisfaction in predicting continuous usage.

5.4. Conclusions

In sum, this article provides empirical evidence to understand user satisfaction of IM use by integrating motivation theory, media richness theory, and social presence theory. The research model incorporates motivational factors (i.e., PE and PU) and media capability factors (i.e., PSP and PMR). PE, PSP, and PU together explained a large percentage (69%) of the variance of user satisfaction. Our results further suggest that for a communication channel, the perceptions of enjoyment and social presence are even more important than usefulness in influencing users' satisfaction with prior use. As one of the first studies to investigate user satisfaction with prior IM use in the voluntary social context, this research has identified the important media capability factors that predict user satisfaction. It is noted that this study was a retrospective survey of past IM use, rather than a concurrent, controlled laboratory study of IM use. We believe that an important future research direction should replicate our study and confirm our findings via a lab study.

REFERENCES

- Bhattacharjee, A. (2001). Understanding information systems continuance: An expectation-confirmation model. *MIS Quarterly*, 25, 351–370.
- Brislin, R. W., Lonner, W., & Thorndike, R. M. (1973). *Cross-culture research*. New York, NY: Method Wiley.
- Cameron, A. F., & Webster, J. (2005). Unintended consequences of emerging communication technologies: Instant messaging in the workplace. *Computers in Human Behavior*, 21, 85–103.
- Carlson, J. R., & Zmud, R. W. (1999). Channel expansion theory and the experiential nature of media richness perceptions. *Academy of Management Journal*, 42, 153–170.
- Chau, P. Y. K. (1997). Reexamining a model for evaluating information centre success using a structural equation modeling approach. *Decision Sciences*, 28, 309–334.
- Chen, K., Yen, D. C., & Huang, A. H. (2004). Media selection to meet communication contexts: Comparing e-mail and instant messaging in an undergraduate population. *Communications of the Association for Information Systems*, 14, 387–405.
- Cho, H.-K., Trier, M., & Kim, E. (2005). The use of instant messaging in working relationship development: A case study. *Journal of Computer-Mediated Communication*, 10, Article 17.
- CNNIC. (2009). *Twenty-third statistical survey report on the Internet development in China*. Retrieved from <http://research.cnnic.cn/>
- Czerwinski, M., Cutrell, E., & Horvitz, E. (2000a). *Instant messaging and interruption: Influence of task type on performance*. Paper presented at the OZCHI 2000 Conference, Sydney, Australia, December 4–8.
- Czerwinski, M., Cutrell, E., & Horvitz, E. (2000b). Instant messaging: Effects of relevance and time. In S. Turner & P. Turner (Eds.), *People and computers xiv: Proceedings of HCI 2000* (Vol. 2, pp. 71–76). London, England: British Computer Society, Springer.
- Daft, R. L., & Lengel, R. H. (1984). Information richness: A new approach to managerial behavior and organizational design. In B. Staw & L. L. Cummings (Eds.), *Research in organizational behavior* (pp. 191–233). Greenwich, CT: JAI Press.
- Daft, R. L., & Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, 32, 554–571.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science*, 35, 982–1003.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1992). Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, 22, 1111–1132.
- Dennis, A. R., & Kinney, S. T. (1998). Testing media richness theory in the new media: The effects of cues, feedback, and task equivocality. *Information Systems Research*, 9, 256–274.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with observable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.
- Fulk, J. (1993). Social construction of communication technology. *Academy of Management Journal*, 36, 921–950.
- Gabarro, J. (1990). The development of working relationships. In J. Galegher, R. E. Kraut, & C. Egido (Eds.), *Intellectual Teamwork: Social and Technological foundations of Cooperative work* (pp. 79–110). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Garrett, R. K., & Danziger, J. N. (2008). IM=Interruption management? Instant messaging and disruption in the workplace. *Journal of Computer-Mediated Communication*, 13, 23–42.
- Gay, G., Stefanone, M., Grace-Martin, M., & Hembrooke, H. (2001). The effects of wireless computing in collaborative learning environments. *International Journal of Human-Computer Interaction*, 13, 257–276.
- Gefen, D., & Straub, D. (2000). The relative importance of perceived ease-of-use in IS adoption: A study of e-commerce adoption. *Journal of the Association for Information Systems*, 1(8), 1–30.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. New York, NY: Prentice Hall.
- Hong, S., Thong, J. Y. L., & Tam, K. Y. (2006). Understanding continued information technology usage behavior: A comparison of three models in the context of mobile internet. *Decision Support Systems*, 42, 1819–1834.
- Horizon Research Consultancy Group. (2007). Chinese enter new times of communication. Retrieved from http://news.qq.com/a/20070703/002743_4.htm (last accessed January, 2012).
- Hsieh, J. P.-A., Rai, A., & Keil, M. (2008). Understanding digital inequality: Comparing continued use behavioral models of the socio-economically advantaged and disadvantaged. *MIS Quarterly*, 32(1), 97–126.
- Hsieh, J. P.-A., & Wang, W. (2007). Explaining employees' extended use of complex information systems. *European Journal of Information Systems*, 16, 216–227.
- Huang, A. H., Hung, S.-Y., & Yen, D. C. (2007). An exploratory investigation of two internet-based communication modes. *Computer Standards & Interfaces*, 29, 238–243.
- Karahanna, E., Straub, D. W., & Chervany, N. L. (1999). Information technology adoption across times: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 23, 183–213.
- Kettinger, W. J., & Grover, V. (1997). The use of computer mediated communication in an interorganizational context. *Decision Sciences*, 28, 513–555.
- Lantz, A. (2003). Does the use of e-mail change over time? *International Journal of Human-Computer Interaction*, 15, 419–431.
- Li, D., Chau, P. Y. K., & Lou, H. (2005). Understanding individual adoption of instant messaging: An empirical investigation. *Journal of the Association for Information Systems*, 6, 102–129.
- Limayem, M., Hirt, S. G., & Cheung, C. M. K. (2007). How habit limits the predictive power of intention: The case of information systems continuance. *MIS Quarterly*, 31, 705–737.
- Mark, G., González, V. M., & Harris, J. (2005). *No task left behind: Examining the nature of fragmented work*. Paper presented at the SIGCHI Conference on Human Factors in Computing Systems, Portland, OR, April 2–7.
- Markus, M. L. (1994). Electronic mail as the medium of managerial choice. *Organization Science*, 5, 502–527.

- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50, 370–396.
- Nunnally, J. C. (1978). *Psychometric theory*. New York, NY: McGraw-Hill.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). New York, NY: McGraw-Hill.
- Parks, M. R., & Floyd, K. (1996). Making friends in cyberspace. *Journal of Communication*, 46(1), 80–97.
- Qiu, L., & Benbasat, I. (2005). Online consumer trust and live help interfaces: The effects of text-to-speech voice and three-dimensional avatars. *International Journal of Human-Computer Interaction*, 19(1), 75–94.
- Renaud, K., Ramsay, J., & Hair, M. (2006). "You've got e-mail!"... Shall I deal with it now? Electronic mail from the recipient's perspective. *International Journal of Human-Computer Interaction*, 21, 313–332.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. New York, NY: Wiley.
- Soe, L., & Markus, M. L. (1993). Technological or social utility? Unraveling explanations of email, vmail, and fax use. *The Information Society*, 9, 231–236.
- Teo, T. S. H., Lim, V. K. G., & Lai, R. Y. C. (1999). Intrinsic and extrinsic motivation in Internet usage. *Omega*, 27(1), 25–37.
- Van de Heijden, H. (2004). User acceptance of hedonic information systems. *MIS Quarterly*, 28, 695–704.
- Venkatesh, V. (2000). Determinants of perceived ease of use: Integrating control, intrinsic motivation, and emotion into the technology acceptance model. *Information Systems Research*, 11, 342–365.
- Walther, J. B. (1992). Interpersonal effects in computer-mediated interaction: A relational perspective. *Communication Research*, 19(1), 52–90.
- Yoo, Y., & Alavi, M. (2001). Media and group cohesion: Relative influences on social presence, task participation, and group consensus. *MIS Quarterly*, 25, 371–390.

ABOUT THE AUTHORS

Wei Wang is a professor at Management School, Jinan University, China. Her research focuses on IT adoption and post-adoption, IS implementation, and E-commerce. Her research has been accepted by EJIS, JCIS, BIT, and others.

JJ Po-An Hsieh is an associate professor at Department of Management and Marketing, The Hong Kong Polytechnic University. His research interests are in the areas of Digital Divide, Adoption and Diffusion of Innovation, and IT Usage Behaviors. He has published papers in MISQ, Management Science, ISR, EJIS, and others.

Baoxiang Song is an Associate Professor at School of Economics and Management, Nanjing University of Chinese Medicine, China. Her current research focuses on knowledge management. Her work has appeared in *Frontiers of Business Research in China*, *Science Research management*, and others.

APPENDIX

Measures and Scales

Perceived Social Presence (PSP)

- PSP1: I feel the communication environment of the instant messaging service is warm.
- PSP2: I feel the communication environment of the instant messaging service is sensitive.

- PSP3: I feel the communication environment of the instant messaging service is personal. (*Deleted*)
- PSP4: I feel the communication environment of the instant messaging service is sociable.

Perceived Media Richness (PMR)

- PMR1: The instant messaging service allows my communication partner and me to give and receive timely feedback. (*Deleted*)
- PMR2: The instant messaging service allows my communication partner and me to tailor our messages to our own personal requirements.
- PMR3: The instant messaging service allows my communication partner and me to communicate a variety of different cues (such as emotional tone, attitude, or formality) in our messages.
- PMR4: The instant messaging service allows my communication partner and me to use rich and varied language in our messages.

Perceived Usefulness (PU)

- PU1: Using the instant messaging service improves my communication performance.
- PU2: Using the instant messaging service increases my communication outcomes.
- PU3: Using the instant messaging service enhances my communication effectiveness.
- PU4: Overall, I find the instant messaging service useful to my communication.

Perceived Enjoyment (PE)

- PE1: I find using the instant messaging service to be enjoyable.
- PE2: The actual process of using the instant messaging service is pleasant.
- PE3: I have fun using the instant messaging service.

User Satisfaction (US)

- US1: I am very satisfied with using the instant messaging service.
- US2: I am very pleased with using the instant messaging service.
- US3: I am very contented with using the instant messaging service.
- US4: I am very delighted with using the instant messaging service.