THE EFFECTS OF SOCIAL COMPARISON ON INTENTION TO USE MOBILE MESSAGING SERVICES

Boonlert Watjatrakul, Department of Information Technology, Assumption University, Bangkok, Thailand, boonlert@scitech.au.edu

Abstract

Mobile messaging services continue gaining high demand and the adoption of mobile messaging has been academically investigated for decades. However, there is a lack of an understanding of how psychological perspective of social comparison—a central feature of human life for self-evaluation—affects individuals’ adoption of mobile messaging services. This study proposes a new model of individuals’ intentions to use a mobile messaging service under the influence of social comparison. The model is empirically tested using the structural equation modeling technique. The results show that social comparison has an effect on individuals’ intentions to use the service through the influences of information seeking and perceived values (social, hedonic and utilitarian values). Social comparison significantly affects information seeking and social value, while perceived values affect individuals’ attitudes and intentions to use mobile messaging services. Further discussions on the analysis results and the implications for theory and practice are presented. This study fills the gap in technology adoption literature and provides guidance for service providers to enhance customers’ intentions to use their mobile services. The paper concludes with limitations of the study and direction of the future studies.

Keywords: Mobile Messaging, Social Comparison, Intention, Social Value, Utilitarian Value, Hedonic Value, and Information Seeking.
1 INTRODUCTION

The ability of text-messaging services to send messages instantly and reliably has added significant utility to the mobile devices. The annual revenue of global mobile messaging market will break USD 300 billion in 2014 and reach USD 334.7 billion by end of 2015 (Portio research, 2011). The usage number of mobile messaging is enormously increased. Many researchers investigated factors affecting technology adoption including mobile service adoption. Few studies, however, have examined mobile service adoption from psychological perspective of social comparison (Shen, 2012). Social comparison is a central role of human social life and helps individuals to compare themselves with others for self-evaluation and information seeking (Shen, 2012). Individuals will engage in social comparison in different purposes (Gibborns and Buunk, 1999). Social comparison has been used to make a prediction on diverse topics as self-regulation, group formation, and interpersonal attraction or rejection (Blanton, 2001). However, there is a lack of studies applying social comparison to predict technology adoption decision, particularly the adoption of a mobile messaging service. To choose a service, many users are not only looking at a service’s functions-a cornerstone of utilitarian value, but also seeking a pleasant service and enhancing their images in society. The roles of hedonic and social motives are hence recognized by the users before adopting a service (Sheth, 1983; Holbrook and Hirschman, 1982). This research encompasses utilitarian, hedonic and social values to explain users’ attitudes toward a service. Furthermore, factors influencing individuals’ intentions to behave would be different between the mandatory and voluntary settings (Venkatesh and Davis, 2000). For instance, people will perceive little hedonic value of services if they have been mandated to use the services. This study decides to examine the adoption of mobile messaging service in the voluntary setting as many mobile messaging applications are available in the market for users’ free choices.

This study aims to understand how social comparison influences individuals’ acceptance of technologies. Especially, the study examines the effect of social comparison on individuals’ attitudes and intentions to use a voluntary mobile messaging service through the key mediators—users’ perceived values and information seeking behavior. The study fills the gap in the technology adoption literature by incorporating a number of well-ground theoretical factors (social comparison, perceived values and information seeking) to explain users’ attitudes and intentions to adopt a voluntary mobile messaging service. It proposes a new framework to understand individuals’ motives of using a mobile messaging service as a result of social comparison and provides guidance for service providers to understand and enhance customers’ intentions to use their services.

The next sections provide the overview of mobile messaging services and theoretical factors—social comparison, information seeking, and perceived values—underpinning the study model. They are followed by the discussions of hypotheses development, research methodology and analysis results. The paper then concludes with the implications and limitations of the study.

2 OVERVIEW OF MOBILE MESSAGING SERVICES

The increasing number of mobile-communications options (e.g., sms, mms, instant messaging, "over-the-top" messaging applications and social media messaging) coming to market is creating significant amounts of traffics and revenues. It was reported that the worldwide mobile messaging market will generate annual revenue at USD 300 billion in 2014 and reach USD 334.7 billion by end of 2015 (Portio research, 2011). With the widespread reach to almost all mobile subscribers, SMS is the most widely used among mobile messaging services. There are two basic technologies used to route and deliver mobile messaging, mobile network protocols and IP protocols (Crocker, 2013). Mobile network messaging (e.g., SMS) uses phone numbers to route mobile messages, while IP-based messaging use specific internet protocol addresses to route mobile messages to particular computing devices including mobile phone.

SMS messaging applications are built into all mobile phone operating systems and phone numbers are used to route messages to the appropriate recipients. This makes SMS messaging ubiquitous across all mobile phones. Presently, many smartphones have provided an opportunity for IP-based mobile
messaging to compete with SMS. IP-based messaging has seen significant adoption in recent years due primarily to its extensibility, openness, and lower cost (Crocker, 2013). Unlike SMS-based messaging which must pass messages through a service carrier before they can be delivered, IP-based messaging use the open internet to deliver messages. It was reported that there will be 27.7 trillion messages by 2016 and 60 percent of them will come from IP-based messaging services such as Google Talk, WhatsApp, Skype, and Facebook Messenger (Crocker, 2013). Although IP-based messaging has a number of advantages over SMS, SMS is still popular among users because its timely delivery, interoperability and ubiquity. As a result, reaching anyone with a mobile phone via an SMS message is efficient. On the other hand, with the numerous choices of IP-messaging applications available to users (e.g., WhatApps, WeChat, Line, Google Talk, Skype), the probability that contact users are regularly using the same service is low. This confuses users and reduces traffic of IP-based messages at present. This study uses SMS well established as the mobile messaging services for investigation.

3 FACTORS UNDERPINNING THE STUDY

The study integrated a psychological perspective of social comparison, perceptions of service values, and information seeking behavior as the key drivers of mobile messaging service adoption. Social comparison refers to individuals’ motivation to gain accurate evaluations of themselves by examining their opinions and abilities in comparison to others (Festinger, 1954). It helps individuals to learn how to define the self, improve performance, and reduce uncertainty in the comparative situations. To gain accurate evaluations of abilities and opinions, individuals try to compare to those in their peer group or with whom they are similar. Social comparison is a central feature of human social life and an essential social phenomenon where human beings compare themselves with others for self-evaluation and information seeking (Buunk and Gibbons, 2007, Shen 2012). Perceptions of relative standing as a result of social comparison can influence many outcomes, including a person’s self-concept, level of aspiration, and feelings of well-being (Suls et al., 2002). Subsequent studies in social comparison theory have identified two kinds of social comparison, upward and downward social comparisons (Suls et al., 2002). The former is when individuals compare themselves with those who they believe are better than them. The latter is when individuals compare themselves to others who are worse than them. The social comparison theory has been extended to different types of opinion comparison, including preference assessment, belief assessment, and preference prediction. However, it has not been used the social comparison to predict the adoption decision of technologies, particularly a mobile messaging service.

Perceived value refers to the whole product evaluation in regard to consumers’ perceptions of the product (Zeithaml, 1988). Value represents a trade-off between benefits (e.g., satisfaction) and sacrifices (e.g., cost), and implies interaction between consumers and products/services. Utilitarian and hedonic values are widely used to understand customer satisfactions with the products or services (Rintamaki et al., 2006). The utilitarian perspective refers that consumers are rational problem-solvers (Bettman, 1979). Therefore, utilitarian consumption is cognitively driven and goal oriented to achieve a functional task (Strahilevitz et al. 1998; Dhar et al. 2000). Service users perceive utilitarian value when their task-related needs are carried out. Rintamaki et al. (2006) argued that most buyers are looking for more than utilitarian value of products. Buyers choose the products not only for functional motive but also for hedonic and social motives (Westbrook and Black, 1985; Sheth, 1983). Hedonic value is consumption experience that related to the multisensory aspect of individual’s experience with products such as enjoyment, feeling and fun (Holbrook and Hirschman, 1982). It can be characterized as self-purposeful and self-oriented (Holbrook, 1999; Babin et al., 1994). Compared with utilitarian value, hedonic value is more abstract and subjective (Rintamaki et al., 2006). Social value refers to the utility derived from product’s ability to enhance social self-concept and is acquired through the association of the product with one or more specific social groups. It relates to social approval and status enhancement of self-image among other individuals. For instance, shoppers may pay for products at stores with a little intention of purchasing, but the process of doing so heightens their status which contributes to social value (Rintamaki et al., 2006). In conclusion, individuals’ perceived values –utilitarian, hedonic and social values– are the essential judgments of the product.
purchase and/or the service use. This study therefore adopts the individuals’ perceived values as important drivers of the mobile messaging service adoption.

Information seeking behavior refers to “purposive seeking of information as a consequence of a need to satisfy some goals” (Willson 2000: p. 49). Information seekers often search specific information in a wide range of sources to fulfill their specific purposes. Information can be sought from manual information systems (e.g., a newspaper or a library) or computer-based systems (e.g., WWW, social network). Information is an important driver of consumers’ attitudes toward product purchase and/or service use. Consumers’ perceptions of the product’s information positively affect their attitudes toward buying the product (Baeuer et al., 2005). In other words, information seeking has an effect on individuals’ attitudes toward purchasing/using a product/service associated with the information received. This study therefore deploys a perspective of information seeking to explain the adoption of mobile messaging service which is an information provision service.

4 HYPOTHESES

Individuals evaluate their own opinions and abilities by comparing themselves to others in order to create and maintain a positive self-image. They can identify their status/value among others by comparing their abilities with the others. Particularly, downward comparisons -comparing with others who are less well off- can elevate self-regard (Wills, 1981). Individuals who believe they have greater abilities to use technology than others (ie., positive comparison outcome) are socially ambitious to project positive images of themselves among their colleagues by demonstrating the skills they have. They are more concerned with their roles and impression they give to others to enhance their social value.

H1: Social comparison will have a positive effect on social value

Shen (2012) argues that social comparison is a social phenomenon where individuals compare themselves with others for self-evaluation and information seeking. In comparison with others’ abilities, individuals seek information to gain accurate and approve self-evaluations in a specific domain of comparison. Service users who want to have better-off comparison with others will acquire knowledge and abilities to use innovative services from information seeking behavior.

H2: Social comparison will have a positive effect on information seeking

Information seekers will attempt to retrieve a wide range of relevant information rather than a few precise ones. It was reported that online consumers who perceive high rational information tend to have higher cognitive response and perceive greater utilitarian value of the website. On the other hand, consumers who perceive high experiential information on the website tend to have higher affective responses and perceive greater hedonic value (Fiore and Kim, 2007). Accordingly, information seeking will influence individuals’ perceived utilitarian and hedonic values of products/services based on information sought.

H3: Information seeking will have a positive effect on hedonic value and utilitarian value

Products that create social self-images of individuals among others will arouse feelings and affective motives of individuals to buy or use the products. Similarly, individuals will enjoy and have positive feelings to use a technology that can project their positive images among their colleagues.

H4: Social value will have a positive effect on hedonic value

Prior research suggested that value dimensions may not be independent and allowed to be interrelated (Sweeney and Soutar, 2001). Babin et al., (1994) found the positive relationship between utilitarian value and hedonic value. Cronin et al., (2000) argued that the consumer's evaluation and appraisal of a product would lead to an emotional reaction supporting the positive influence of utilitarian value on hedonic value.

H5: Utilitarian value will have a positive effect on hedonic value
In the study of the value-attitude-behavior relationships, Homer and Kahle (1988) posited that values have internal and external dimensions that influence attitudes and behavior. Hsu and Lu (2004) contended that people tend to adopt technology to gain acceptance from their communities (i.e., social value). Some people have little intention of purchasing, but purchase products to enhance their status or self-esteem which contributes to social value (Rintamaki et al., 2006). Furthermore, Babin and Attaway (2000) contended that consumers who perceived utilitarian and hedonic values of the website had a positive attitude toward online shopping. Accordingly, we propose that consumers’ perceived values of a technology influence their attitudes toward using the technology.

H6: Social, hedonic and utilitarian values will have positive effects on attitudes toward using a technology

Many studies have investigated an individual’s attitude to describe the cause of his or her intention behavior. In the IS literatures, extensive studies affirm the positive impact of users’ attitudes on their intentions to use an information system (e.g., Homer and Kahle, 1988; Davis, 1989; Fishbein and Ajzen, 1975). Hence, individuals who have a more favorable attitude towards a technology will have a greater intention to use the technology.

H7: Attitudes toward a technology will have a positive effect on intentions to use a technology

In summary, the hypothetical relationships of the study’s factors can be depicted in Figure 1.

Figure 1: Research model

5 METHODOLOGY

The study deployed the survey method for data collection. The questionnaire had two sections. The first section required the respondents’ agreement with the statements related to the study factors using a five-point Likert scale (5=strongly agree, 1=strongly disagree). The second section required the respondents’ biographic data. The questionnaires were administered in the class rooms by the approval of class instructors. 248 students at a university recently implementing mobile messaging service for students participated in this study. After going through the survey responses, 238 questionnaires were usable, giving a response rate of 95.96 %. The usable data were greater than the threshold of 200 and above 10 times of the study parameter (17 parameters) giving a sufficient power for data analysis using the structural equation modeling technique (Barrett, 2007; Garver and Mentzer, 1999). 60 percent of respondents are males and 88 percent age between 18 and 24 years. The structural equation modeling (SEM) technique was deployed for data analysis. The measurement model first examines reliabilities and validities of the study’s constructs. The structural model then applied to examine the casual relationships of the proposed model.

5.1 Analysis of the measurement model

The measurement model’s overall goodness of fit was examined before proceeding to assess reliability and validity of the model. Table 1 shows seven goodness of fit indices-the ratio of chi-square ($\chi^2$) to degree-of-freedom (df), goodness of fit index (GFI), normalized fit index (NFI), adjusted goodness of fit index (AGFI), comparative fit index (CFI), incremental fit index (IFI) and
root mean square error of approximation (RMSEA). They were above the recommended levels (e.g., Hair et al., 1998) confirming a reasonably good fit with the collected data ($\chi^2$/df=1.409, GFI=.937, NFI=.935, AGFI=.901, CFI=.980, IFI=.980, RMSEA=.042).

<table>
<thead>
<tr>
<th>Fit indices</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>NFI</th>
<th>AGFI</th>
<th>CFI</th>
<th>IFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested level</td>
<td>≤ 3.00</td>
<td>≥ 0.90</td>
<td>≥ 0.90</td>
<td>≥ 0.80</td>
<td>≥ 0.90</td>
<td>≥ 0.90</td>
<td>≤ 0.80</td>
</tr>
<tr>
<td>Measurable value</td>
<td>1.409</td>
<td>.937</td>
<td>.935</td>
<td>.901</td>
<td>.980</td>
<td>.980</td>
<td>.042</td>
</tr>
</tbody>
</table>

Table 1: Fit indices of measurement model

Reliability of the factors was estimated by composite reliability and can be calculated as follows: (square of the summation of the factor loadings)/(square of the summation of the factor loadings) + (summation of error variables) (Fornell and Larcker, 1981). Factor loadings and error variables were indicated in Table 2. The composite reliability for all factors in the measurement model was above 0.70 indicating the adequate reliability of the constructs (see Table 3).

<table>
<thead>
<tr>
<th>Constructs and items</th>
<th>Factor loadings</th>
<th>Variance of error items</th>
<th>Constructs and items</th>
<th>Factor loadings</th>
<th>Variance of error items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social comparison</td>
<td>sc1 0.719 0.376</td>
<td>sc2 0.706 0.414</td>
<td>sc3 0.857 0.241</td>
<td>Utilitarian value</td>
<td>uv1 0.753 0.460</td>
</tr>
<tr>
<td>Information seeking</td>
<td>is1 0.842 0.364</td>
<td>is2 0.847 0.356</td>
<td>is3 0.727 0.516</td>
<td>Hedonic value</td>
<td>hv1 0.814 0.287</td>
</tr>
<tr>
<td>Attitudes</td>
<td>at1 0.817 0.276</td>
<td>at2 0.751 0.429</td>
<td>at3 0.835 0.311</td>
<td>Social value</td>
<td>sv1 0.806 0.300</td>
</tr>
</tbody>
</table>

Table 2: Factor loadings and error items

Convergent validity of the factors was estimated by average variance extracted (AVE). The average variance extracted above the 0.5 level is recommended for the acceptable convergent validity (Hair et al., 1992). Table 3 indicated that all AVEs of the factors in the measurement model were greater than 0.6. Discriminant validity was examined by comparing the shared variance between constructs with the average variance extracted of the individual construct (Fornell and Larcker, 1981). This analysis indicated that the AVEs of the individual factors were greater than the shared variance between constructs confirming acceptable discriminant validity (Table 3). In summary, the measurement model presented adequate reliability, convergent validity, and discriminant validity.

5.2 Analysis of the structural model

The fit-model indices with their corresponding suggested levels are shown in Table 4 ($\chi^2$/df=1.805, GFI=.914, AGFI=.880, NFI=.907, CFI=.956, IFI=.956, RMSEA=.058). The results provide evidence
of a good model fit of the structural model. Figure 2 presents the results of the casual path analysis including standardized path coefficients and squared multiple correlations of endogenous variables.

<table>
<thead>
<tr>
<th>Fit indices</th>
<th>$\chi^2$/df</th>
<th>GFI</th>
<th>AGFI</th>
<th>NFI</th>
<th>CFI</th>
<th>IFI</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suggested level</td>
<td>$\leq 3.00$</td>
<td>$\geq 0.90$</td>
<td>$\geq 0.80$</td>
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<td>$\leq 0.80$</td>
</tr>
<tr>
<td>Measurable value</td>
<td>1.805</td>
<td>.914</td>
<td>.880</td>
<td>.907</td>
<td>.956</td>
<td>.956</td>
<td>.058</td>
</tr>
</tbody>
</table>

*Table 4: Fit indices of structural model*

*Figure 2: Analysis model*

**DISCUSSION**

The results show that 65.7 percent of variance of behavioral intention to use the mobile messaging service can be explained by the purposive factors (Figure 2). As anticipated, social comparison significantly affects social value and information seeking (H1-H2 are supported), while information seeking significantly affects hedonic and utilitarian values (H3 is supported). Social value and utilitarian value significantly influence hedonic value (H4-H5 are supported). Finally, three perceived values (social, hedonic and utilitarian) significantly affect attitudes toward technology (H6 is supported), and in turn affect behavioral intention (H7 is supported).

Social comparison affects individuals’ intentions to use the mobile messaging service through the influences of perceived values (social, utilitarian and hedonic), information seeking and attitudes towards the service. Table 5 indicates that social comparison directly affects information seeking and social value, while indirectly affects utilitarian value, hedonic value, and attitudes toward using the service. Comparing the effects of perceived values on users’ attitudes and intentions to use a mobile messaging service, utilitarian value has a greater impact than social and hedonic values (see Table 5).

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Total effect (indirect effect)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SC</td>
</tr>
<tr>
<td>IS</td>
<td>.647</td>
</tr>
<tr>
<td>SV</td>
<td>.532</td>
</tr>
<tr>
<td>UV</td>
<td>.252(.252)</td>
</tr>
<tr>
<td>HV</td>
<td>.359(.359)</td>
</tr>
<tr>
<td>AT</td>
<td>.377(.377)</td>
</tr>
<tr>
<td>BI</td>
<td>.306(.306)</td>
</tr>
</tbody>
</table>

*Table 5: Total and indirect effects*
Comparing with their friends, students who believe they are an expert and/or the first person who knows about the latest mobile services (i.e., positive comparison judgment) greatly perceive the social value of a mobile messaging service. They tend to present their expertise about the mobile service to their friends in order to project positive image of themselves among others. As the service enables students’ positive image/status among their friends, students will have positive attitudes toward the service and in turn enhance their intentions to use the service.

Students who believe they have knowledge about mobile messaging service better than their friends will attempt to seek more knowledge and updated information about the mobile services to remain a positive comparison judgment. The result also shows that when students seek more information about the mobile messaging service, they will perceive utilitarian and hedonic values of the service. They will learn more about functions and benefits that they can gain from using the service. For example, students can receive the messages that are customized to their profile and enjoy using the university’s mobile messaging service. The study confirms the previous studies’ results regarding the effects of perceived utilitarian and hedonic values on users’ attitudes and intentions to use technologies (Babin and Attaway, 2000; Davis, 1989).

7 IMPLICATIONS FOR THEORY AND PRACTICE

The study provides theoretical and practical implications. The theoretical implications are twofold. First, this research fills the gap in literatures regarding the determinants of technology adoption. Previous studies applied social comparison to make prediction on diverse topics as self-regulation, group formation, and interpersonal attraction or rejection (Blanton, 2001). This study contributes to the existing literature in technology adoption by applying social comparison to predict individuals’ intentions to use a technology. It uses factors extracted from the theories of perceived values and information seeking to complementarily explain the effects of social comparison on an individual’s intention to use a technology. Individuals who believe they have higher knowledge about technology than their colleagues (positive comparison judgment) will perceive greater social, utilitarian and hedonic values of the technology and in turn influence their intentions to use the technology. Second, the study empirically validates the results from previous studies regarding the effects of perceived values (utilitarian, hedonic and social values) on attitudes towards technology adoption (Babin and Attaway, 2000). It also extends and successfully tests the effect of social value on hedonic value.

The practical implications are threefold. First, individuals who know about a technology service better than their colleague/group members are easier to adopt (buy or use) the service. As a result, service providers might target their potential customers (e.g., value customers, loyalty customers) by providing them with more detailed and timely information of the services offered to make them feel they have better knowledge and abilities to use the service than others. Second, the study indicates the significant effect of social comparison on information seeking behavior. Comparing with their colleagues, users who want to position themselves among others will seek more information to enhance their knowledge about the services. Service providers, therefore, should make relevant information of the services conveniently accessible by the users (e.g., websites on mobile, social media). Third, service providers nowadays need to create and deliver customer value to survive in today’s competitive marketplace. The study shows that individuals will use a service when they perceived utilitarian and hedonic values of the service. Accordingly, service providers should demonstrate how their services are useful and evoke their users’ impression. For instance, they might offer the demo/trial services to urge their potential users to perceive the utility and appreciation of their services. In addition, the result indicates that utilitarian value has a greater impact than other values on users’ intentions to use the mobile messaging service (see Table 5). Service providers should therefore emphasize and improve the features of their mobile messaging service (e.g., providing customized and timely information).
8 LIMITATIONS AND FUTURE STUDIES

The study provides some suggestions to improve on the study limitations. Firstly, social comparison is broadly comparative judgment based on the unique domain of a given comparison. The study focuses on the adoption of SMS-based messaging service. Future studies applying the study model to examine the IP-based messaging services (e.g., Google Talk, WhatsApp and Skype) are suggested to broaden knowledge of the social comparison’s effect on mobile messaging service adoption. Secondly, this study investigates the research model in the voluntary setting. The factors influencing individual behavior to adopt a technology are different between mandatory and voluntary circumstances (Venkatesh and Davis, 2000). Future study applying the study model to examine mobile messaging services in the mandatory setting is suggested to extend the study results. Thirdly, the assessment of perceived value is not a ‘one-off’ phenomenon and must be seen as an ongoing assessment (Holbrook, 1999). A longitudinal study might be conducted to track the change of value assessments to validate the study results. Finally, the study uses a university’s students as a subject of analysis. To enhance the generalizability of this study, it is worth to validate the research model by including students from different universities or using different subjects of analysis (e.g., employees, online communities).

9 CONCLUSIONS

This study proposes a new framework to examine the effect of social comparison on individuals’ intentions to use a mobile messaging service. Using the structural equation modeling technique, the results indicate that social comparison affects individuals’ intentions to use a mobile messaging service through the influences of perceived values (utilitarian, hedonic and social), information seeking and attitudes toward the service. The positive social-comparison judgment (higher knowledge and ability than others) significantly affect perceived social value and information seeking, while information seeking significantly affects utilitarian and hedonic values. This study extends knowledge in the area of information technology adoption. Service providers can use the study results as guidance to enhance customers’ intentions to use their services based on the psychological perspective of social comparison.

References


