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Analysis of differences in internet user experiences and virtual network activities in Taiwan

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Considered a crucial industrial development in the 21st century, the Internet has had a marked effect in shaping modern society. The ongoing development of handheld mobile Internet devices has enabled services in the virtual world to be updated constantly, thereby providing numerous options regarding the virtual network interactions and activities of Internet users. Among the various virtual network activities, people and organizations can form friendships, purchase commercial goods, engage in virtual role-playing activities, and form virtual communities or families through the digital devices. For this study, we adopted an array of statistical methods, including descriptive statistics, independent samples *t* tests, analysis of variance, and factor analysis, to explore the differences in how virtual network behavior factors influence users from varying backgrounds and with varying levels of experience using the Internet. The analysis results revealed the effects of the time spent online per day, the length of time spent using the Internet, and owning multiple network accounts.

Key words: Virtual network world, online network activity, user behavior, virtual community.

INTRODUCTION

Considered a crucial industrial development in the 21st century, the Internet has had a marked effect in shaping modern society. The ongoing development of handheld mobile Internet devices has enabled services in the virtual world to be updated constantly, thereby providing numerous options regarding the network interactions and activities of Internet users (Jung and Kang, 2010; Mantymaki and Salo, 2011; Lin et al., 2011). Among the various network activities, people and organizations can form friendships, purchase commercial goods, engage in virtual role-playing activities, and form virtual communities or virtual families using Internet devices

(Eisenbeiss et al., 2012).

Subsequently, ties and communication between people in the virtual world have been extended to the real world, and the boundary between the two worlds has become blurred. Internet romances and online fraud demonstrate that trust exists in online interpersonal relationships, which is a key factor that influences people's willingness to communicate and share information (Gefen, 1997; Jarvenpaa et al., 1998). In virtual communities, familiarity with community members and perceived trust have a positive effect on people's knowledge-sharing intentions (Zhao et al., 2012). A widely reported problem among

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network users is that they do not trust the security of Web sites, and concerns have been voiced regarding Web site security mechanisms. Because of the minimal entry requirements, access to Web sites is difficult to control, and online criminal activities are frequently reported. Numerous issues regarding personal privacy infringements resulting from using the Internet have emphasized the importance of privacy security and protection (Yang, 2011). The disparity of interpersonal social interactions between virtual and real-world network activities, however, raises unprecedented problems. Consequently, given the deficiencies of current legal systems, protecting people's rights and interests online remains difficult (Yang, 2011).

Results of online surveys have revealed that the more prevalent the Internet becomes and the larger its application scope, the more people rely on it in their daily lives. Most real-world activities correspond to similar activities on the Internet, such as forming friendships, sharing information, learning new skills, trading or purchasing goods, and playing online games or engaging in other recreational activities (Mantymaki and Salo, 2011).

This study investigated the phenomena of network activities in the daily lives of network users and the possible factors influencing online use behavior and decision-making at the individual level. Previous studies have primarily focused on a single dimension, such as privacy, rather than adopting a holistic perspective. Therefore, this study adopted a more comprehensive method and simultaneously investigated six dimensions and their possible interacting influences. Adopting the perspective of users, we gathered and analyzed data regarding the network behaviors of network users in Taiwan. In this paper, we discuss the factors that influence such behavior and provide suggestions for practitioners and researchers. For this study, we adopted an array of statistical methods, including descriptive statistics, independent samples *t* tests, analysis of variance (ANOVA), and factor analysis, to examine the factors that influence the quality of user behavior for network activity and other relevant variables, from which 31 questionnaire items were derived. After conducting a questionnaire survey, data were organized, analyzed, and summarized through an analytical process that involved (1) collecting information on the respondents' background and their Web experiences to use as the basis for the statistical analysis; (2) examining the various backgrounds of users to determine the influence of network behavior factors; and (3) exploring the differences among user experiences to determine the influence of network behavior factors. We explored the factors influencing the quality of users' network behaviors by examining their current status and behavioral patterns to provide a reference for future researchers or network operators seeking to enhance the quality of their network services.

LITERATURE REVIEW

Depending on their purpose, network activities can be classified as related to virtual communities, online electronic trading, online friend-making, digital leisure and recreation, and e-learning (Yoo, 1996; Jung and Kang, 2010). Each type of network activities involves a unique pattern of management and operation. Virtual communities are a form of online virtual interpersonal relationships, where members share their experiences, information, and knowledge (Rheingold, 1993; Jung and Kang, 2010; Zhao et al., 2012). Examples of virtual communities include forums, blogs, Wikis, and bulletin board systems (BBS), through which users with similar sentiments or interests but distinct backgrounds establish virtual social networks by communicating and interacting through these networks (Lu et al., 2010). A virtual community is a virtual organization comprising members who might not know each other (Kannan, 1998; Lee et al., 2002). Currently, opinions from online communities can influence consumer purchase decisions (Zhao et al., 2012). Underlying user intentions to participate in virtual social networks are five key values: purposive value, self-discovery, entertainment value, social enhancement, and maintaining interpersonal connectivity (Cheung et al., 2011). Currently, the most popular social networks or community Web sites in Taiwan are (in order of popularity) Facebook (used by approximately 80% of Internet users in Taiwan), Wretch, Yahoo, Plurk, and Atlaspost. Facebook is the most widely adopted and popular social networking Web site among students worldwide (Cheung et al., 2011). In this study, the most frequently reported user behaviors in virtual communities are summarized as follows: (1) registering for membership to a specific social community; (2) providing false information to win the trust of other users; (3) obtaining personal information through cheating or fraud; (4) reading or sharing information; (5) discussing popular topics; (6) participating in real-world activities that are extended from virtual communities; (7) expressing personal opinions (e.g., clicking a "like" button); and (8) massive researching by using Internet media, such as blogs and forums (e.g., the "human flesh search engine").

Online trading benefits both enterprises and users, and it meets individual demands for trading or purchasing services. Using networks and mobile devices to conduct trading, online trading or purchase behaviors are relatively free of temporal and spatial constraints (Woo et al., 2004; Lin et al., 2011). User behaviors related to Internet transactions or trade can be summarized as follows: (1) after completing a registration procedure where a user's identity has been authenticated, the user may initiate an Internet transaction or open an online store; (2) sharing purchase experiences; (3) launching promotional campaigns to increase brand exposure; (4) searching for product information through online word-of-mouth (WOM); (5) comparing prices; (5) managing cash

flow and logistics after selling or purchasing an item; (6) making mutual evaluations after purchasing goods or services; and (7) bidding in an online auction.

For people who exhibit antisocial tendencies in the real world and experience difficulty forming friendships, online social activities may complement and mediate their interpersonal problems because they can initiate conversations with strangers about their feelings, thoughts, perceptions, and values rapidly without fear of rejection (Young, 1997). An exceptionally high percentage of users establish new friendships and interact and chat with other users through the Internet (Eisenbeiss et al., 2012). Two schools of thought exist regarding online or virtual friend-making; the first one holds that the Internet offers and can create new types of interpersonal relationships (Rheingold, 1993), and the other perspective contends that using the Internet undermines and leads to the loss of traditional interpersonal relationships (Beninger, 1987). In recent years, the development of social network-based electronic commerce has become a new business trend (Lu et al., 2010). In this study, Internet users' online friend-making behaviors are summarized as follows: (1) registering for membership under a pseudonym; (2) interacting with online friends in a virtual space; (3) fulfilling real-world fantasies through role-playing activities involving virtual characters; (4) engaging in real-world interactions as an extension of virtual interactions; and (5) updating personal statuses and forwarding messages.

RESEARCH METHODOLOGY AND DEFINITIONS

According to the objective of this study, all Internet users were considered suitable for participation as a research target or questionnaire respondent, regardless of the type of device they use to connect to the Internet. We administered a questionnaire as a tool for acquiring research data. Considering the geographical restrictions, in this study, we adopted a convenience sampling method to collect data. Statistical analysis tools were used during the analytic phase, and the research data underwent a descriptive statistical analysis. For statistically significant differences in the data, Scheffé's method was applied for a post hoc comparison to examine the variance between the groups of network users.

In addition to having various reasons and motivations for using the Internet, network users may exhibit distinct thinking patterns that are based on how they perceive and respond to external stimuli. Previous studies have shown that user types can be differentiated based on various perspectives. For example, from the perspective of information needs, users may have different preferences and information behaviors (Wilson, 2000). Regarding personality traits, individual behaviors are consistent and regular because each person possesses source traits. According to Cattell (1972), each person's unique personality comprises 16 personality factors. Depending on how often they use networks, users can be categorized as digital leaders, connoisseurs, hippies, and onlookers. However, various sources of stimulation in the real and virtual world as well as individual motivations have distinct influences on the network behaviors of users. Factors influencing user network behaviors and decision making comprise the six dimensions of trust, reputation, network security, WOM, network privacy, and Web ease-of-use. This study adopted these

dimensions to form the theoretical basis of the questionnaire design. This study adopted 31 questions based on these six dimensions, which are defined as follows:

(1) Trust: The dimension of trust refers to a positive expectation that the other party will honor a verbal promise (Deutsch, 1973; Boon and Holmes, 1991). A trust relationship is the foundation on which people choose partners for cooperation and mutual belief (Fuhrt, 2005). Numerous studies have shown that user trust in a Web site exerts a positive influence on user purchase intentions (Lim et al., 2006; Wulf et al., 2001; Jarvenpaa and Tractinsky, 1999; Lin et al., 2011). Based on our review of relevant literature (Mayer et al., 1995; Krackhard & Brass, 1994), the questions for the trust dimension are (Q1) "In the real world, I tend to believe others except under special circumstances or for certain reasons"; (Q2) "I believe the opinions and comments of online friends who I have never met in person"; (Q3) "Information from the Web can and should be trusted"; (Q4) "Evaluative comments found online can be trusted"; (Q5) "Internet advertisements can be trusted"; (Q6) "When I browse or log onto certain Web sites, it means I support and identify with these Web sites"; (Q7) "When a stranger adds me as a friend, I add him or her to my contact list or as a friend."

(2) Reputation: This dimension refers to the credibility or fame that a person or corporation utilizes for social activities, or the influence of a corporation's brand image (Sharif and Kalafatis, 2005). Numerous previous studies have shown that a positive reputation is a key factor for building or creating trust (Antony et al., 2006; Boot and Greedbaum, 1993; Moukas et al., 1999; Resnick and Zeckhauser, 2000; Jarvenpaa et al., 1999; Kim et al., 2008). Currently, indicators for measuring the brand image of a company include company image, WOM reviews, popularity, and company reputation. By adopting the opinions of various scholars (Dowling, 1994), we developed the questions to measure the reputation dimension: (Q8) "I search for product information regarding well-known Internet brands"; (Q9) "When making decisions, I refer to online evaluations first or as a priority"; (Q10) "A company Web site benefits the company's image"; and (Q11) "Reputation is a decisive indicator that influences my participation or performance in network activities."

(3) Network Security: Network security presents a challenge for network activities. Considering the rising annual trend in cyber or online crime, if a business can guarantee or commit to providing a secure network for customers, it would considerably reduce the cost of mutual monitoring and enhance user trust when making purchases. Questions for the network security dimension in this study are: (Q12) "I think existing laws are sufficient to protect my rights and interests on the Internet"; (Q13) "There are adequate security and protection facilities on the Internet"; (Q14) "The Internet is a stable and secure virtual environment"; and (Q15) "I update my passwords and antivirus software regularly."

(4) Word-Of-Mouth (WOM): When users engage in network activities, their decision-making is subject to information obtained from other users, and they share information or comments with other users. Facilitated by the network platform, the transmission of WOM can exert a widespread influence on the purchase intentions of other users. The influence of a social network includes both positive and negative WOM (Kuan and Bock, 2007). WOM has been considered as a crucial factor for businesses and brands competing with each other (Murray, 1991; Bone, 1995). After summarizing the findings of previous studies (Kim and Prabhakar, 2004; Kuan & Bock, 2007), we designed the following questions regarding the WOM dimension: (Q16) "I am willing to share my experiences of using the Web with others"; (Q17) "The positive or negative WOM of online users affect my willingness to participate in network activities"; (Q18) "I deliberately spread positive or negative WOM related to Web sites"; (Q19) "I am particularly concerned with opinions provided by opinion leaders on the Web"; and (Q20) "I think Web sites with higher popularity have more positive WOM."

Table 1. Results of reliability and validity analysis.

Dimension	Question no.	Cronbach's α	α for the overall questionnaire
Trust	1, 2, 3, 4, 5, 6, 7	0.668	
Reputation	8, 9, 10, 11	0.625	
Security	12, 13, 14, 15	0.857	
WOM	16, 17, 18, 19, 20	0.758	0.847
Privacy	21, 22, 23, 24, 25, 26	0.685	
Web ease-of-use	27, 28, 29, 30, 31	0.795	

(5) Network Privacy: When users engage in network activities, their private information should be protected from infringement. Well-established content or information and privacy protection is a key factor attracting online users to participate in Internet communities (Chang et al., 1999). Effective consumer privacy protection in e-commerce is a crucial condition for developing e-markets (Yang, 2011). When Facebook allowed greater access to the personal information of its users, there was an increase in information abuse, identity theft, and other privacy risks (Whelan, 2005). Based on the opinions of experts (Malhotra et al., 2004), we developed the following questions for the network privacy dimension: (Q21) "When participating in network activities, I feel that my privacy could be violated at any time"; (Q22) "The more rigorous the Internet privacy protection policies are, the more secure the Internet is and the more guarantees it provides"; (Q23) "I believe the privacy assurance statement provided by Web sites"; (Q24) "I participate in network activities anonymously or by using a pseudonym"; (Q25) "I do not care about my personal information being disclosed on the Internet"; and (Q26) "I am excited when someone searches for my personal information."

(6) Web Ease-of-use: This dimension refers to the convenience and ease of understanding how various network activity interfaces are operated. Perceived ease-of-use and perceived usefulness are critical variables that influence the attitudes and behaviors of information system users (Davis et al., 1989). Unfamiliarity with a Web site is likely to cause users to visit other sites. By referencing and summarizing the opinions of experts (Yoo, 1996; Davis et al., 1989), we designed questions for the ease-of-use dimension, including (Q27) "It is easy to participate in virtual community activities"; (Q28) "Online shopping is easy"; (Q29) "Making friends online is easy"; (Q30) "Online recreational or leisure activities are easy to perform"; and (Q31) "Learning in a digital environment is easy."

BEHAVIORAL DIFFERENCE ANALYSIS

Data collection

Before issuing the formal questionnaire, a pretest was conducted to evaluate the appropriateness of the questionnaire semantics and content. Nonsignificant questions were removed according to the results of an analytical evaluation of the pretest questionnaire. For the final questionnaire, we revised the wording of the questions to fit the context of this study. We administered 50 pretest questionnaires and received 42 responses, among which 39 were valid. Using the valid questionnaires, we analyzed the response to determine the reliability of the questionnaire items. The results

showed that (1) The correlation coefficients of the 31 questions and factor loadings all exceeded the standard of 0.3, except for Q2, which was eliminated; and (2) A KMO measure of sampling accuracy test and a Bartlett test of sphericity yielded a KMO value of 0.867 and a Bartlett test of sphericity value of 3022.658 ($p < 0.001$). The factor analysis results indicated that two pairs of variables, reputation and WOM as well as network security and privacy, had similar attributes. For this study, we used Cronbach's α coefficient to analyze the internal consistency of the questionnaire items in terms of the research dimensions and to assess the reliability and validity of the entire questionnaire. A high α -coefficient represents high consistency among the questions, and indicates that questionnaire items accurately reflect the actual characteristics of the participants. The analysis results in Table 1 show that the Cronbach's α -coefficients ranged from 0.625 to 0.857, and the Cronbach's α -coefficient of the overall questionnaire was 0.847, indicating that both the overall questionnaire and each dimension achieved high internal consistency and adequate reliability.

Data analysis for samples

For this study, we distributed 310 questionnaires, 293 of which were returned, yielding a response rate of 94.5%. Among the returned responses, 274 of them were valid, yielding the available rate of 88.39%. The demographic variables in this study were gender, age, education level, monthly income, and area of residence (Table 2). Most of the respondents were women ($n = 144$, 52.6%). Regarding age distribution, most of the respondents were young (that is, 26 to 35 years of age, $n = 90$, 32.8%) or middle-aged (that is, 36 to 45 years of age, $n = 75$, 27.4%). The education level of the respondents was concentrated at universities and colleges ($n = 151$, 55.1%), followed by senior high school or vocational high school ($n = 74$, 27%), then junior high school ($n = 31$, 11.3%), graduate school and above ($n = 14$, 5.1%), and elementary school or below ($n = 4$, 1.4%). The average monthly income of most respondents was within the NT\$20,001 to NT\$50,000 range ($n = 149$, 54.4%), followed by NT\$20,000 and below ($n = 64$, 23.4%). Most

Table 2. Sample demographics ($n=274$).

Variable	Item	Count	Percent
Gender	Man	130	47.4
	Woman	144	52.6
Age	15 years or below	28	10.2
	16-18 years	7	2.6
	19-25 years	50	18.2
	26-35 years	90	32.8
	36-45 years	75	27.4
	46-55 years	19	6.9
	56 years or above	5	1.8
Education level	Elementary school or below	4	1.5
	Junior high school	31	11.3
	High school	74	27.0
	Four-year or two-year college	151	55.1
	Graduate school or above	14	5.1
Monthly income	NT\$20,000 or below	64	23.4
	NT\$20,001-50,000	149	54.4
	NT\$50,001-80,000	52	19.0
	NT\$80,001-100,000	6	2.2
	NT\$100,001 or above	3	1.1
Area of residence	Northern Taiwan	127	46.4
	Central Taiwan	110	40.1
	Southern Taiwan	27	9.9
	Eastern Taiwan	4	1.5
	Offshore island	5	1.8
	Others	1	.4

respondents lived in Northern Taiwan ($n = 127$, 46.4%) and the Central Taiwan ($n = 110$, 40.1%).

A cross-analysis of the time spent online per day and gender revealed that most respondents (40.9%) spent less than 2 h/day online. Regarding gender differences, more men (27%) than women (9%) reported used the Internet for a long period each day (that is, > 6 h/day). A cross-analysis of Internet experience and education level showed that most respondents had used the Internet for longer than 5 years (70.8%). Moreover, the results indicated that people have a high level of reliance on the Internet. Including the respondents' education level revealed that higher education levels were associated with greater experience in using the Internet. A cross-analysis of gender and the devices used to connect to the Internet revealed that most respondents used a desktop computer to access the Internet (81%), followed by laptop computers (51.1%). However, with the emergence of mobile networking technologies, almost half of the respondents reported using a smart phone to browse or

connect to the Internet (44.9%). Among these respondents, more women (48%) than men (41%) reported using a smart phone to access the Internet. Regarding the types of network activity that the respondents performed or participated in, most users reported engaging in online community-based activities (62.8%), followed by information searching (58%). Among the virtual community activities, network communities and blogs were the most frequently accessed and employed services. An analysis of online trading activities revealed that women exhibited stronger preferences for online shopping. Therefore, in the future, promotional campaigns or activities for mobile devices or smart phone applications should be designed to target women's needs in order to create superior effects. Regarding online friend-making activities, instant messaging was the tool most frequently used by interviewees. However, men exhibited a greater preference for playing online games.

Another cross-analysis was performed to determine whether the network activities correlated with user

occupation. The results show that people employed in network-related industries were heavy Internet users (with a low correlation, 25.2%). Currently in Taiwan, the most popular Web sites are Yahoo! (97.8%) for online electronic trading; Facebook (71.5%) for participating in virtual communities; MSN (43.1%) for forming new online friendships; and YouTube (51.1%) for digital leisure and recreation activities. A cross-analysis of gender and whether network activities were performed anonymously showed that most users had one or two anonymous accounts (60.9%), and nearly a quarter of all users owned three to four accounts (23.7%). Comparatively, men typically had more anonymous accounts. More than half of the respondents used different accounts for specific network activities accounted (57.7%). Users older than 46 years of age typically did not use multiple online accounts.

Difference for varying background variables

Here presents the results of an independent samples *t* test and one-way ANOVA to explain how the background variables influence network user behavior. When significant differences were identified, Scheffé's method was applied for post hoc multiple comparisons. The users' background variables (gender, age, education level, monthly income, and area of residence) were used as a basis for identifying which factors affected their network behaviors in terms of the six dimensions of trust, reputation, security, WOM, privacy, and Web ease-of-use. The analysis results are detailed as follows:

(1) Gender: Regarding gender, Table 3 shows that among the factors affecting network user behavior, the only factors yielding significant differences between genders were reputation ($t = -1.262^*$) and privacy ($t = 3.142^*$). Possible reasons for these differences include the following: (a) compared to the male respondents, who had their own opinions and were less biased based regarding famous brands and images, the female respondents cared more about brands; (b) a digital divide persists between genders; specifically, men possess broader, deeper, and more values for information knowledge than do women. Consequently, men were more concerned than women regarding privacy-related rights and interests.

(2) Age: Regarding age differences show significant differences in trust ($F = 3.632^{**}$), reputation ($F = 4.563^{***}$), WOM ($F = 2.629^*$), and Web ease-of-use ($F = 3.118^{**}$) among the factors affecting network users. Further analyses revealed that all variable pairs for trust, reputation, and Web ease-of-use reached the level of significance, except for WOM. Overall, users younger 15 years of age exhibited a low ratio regarding various factors, indicating that younger user did not possess significant demands for the various influencing factors.

This may be because younger users have been using online networks from an early age; hence, they are less sensitive to being influenced by network behavior factors, and they exhibit lower levels of awareness and precautionary consciousness. This may also explain why social problems generated through the Internet manifest regularly among adolescents. Based on these results, we recommend enhancing efforts to promote Internet safety and educate young people about the involved dangers.

(3) Education level: Regarding the differences in education level, trust ($F = 4.659^{**}$), reputation ($F = 5.243^{***}$), and Web ease-of-use ($F = 6.778^{***}$) showed significant differences for influencing network users. Further analyses revealed that the differences between all groups were statistically significant. Overall, higher levels of academic achievement correlated with higher requirements of trust, reputation, and Web ease-of-use. Furthermore, the users with higher educational levels were more experienced in networking and using the Internet. Consequently, they possessed a stronger sense of subjective awareness, had more insightful perceptions and ideas for differentiating the influence of external assessments, and they could understand and control information effectively. When reputation and trust levels were high, they did not need to pay special attention or be careful when using the Internet. Thus, trust and reputation enhance Web ease-of-use.

(4) Monthly income: Among the monthly income groups, reputation ($F = 5.470^{***}$), WOM ($F = 2.632^*$), and Web ease-of-use ($F = 2.688^*$) presented significant differences for influencing the behavior of network users. Further analyses revealed that the results for only reputation and WOM achieved statistical significance, whereas Web ease-of-use did not. Generally, the respondents with monthly incomes of NT\$50,000 to NT\$80,000 paid more attention to reputation and WOM, possibly because they are middle-class workers who are excessively rely on external sources of information when making decisions; hence, they rely on the opinions or comments of experts or opinion leaders.

(5) Area of residence: Network security ($F = 2.889^*$), WOM ($F = 3.905^{**}$), and privacy ($F = 2.787^*$) exhibited significant differences among respondents living in different areas. Further analyses revealed that network security and privacy groups did not reach the level of statistical significance. WOM was the only factor affecting network users based on their area of residence, where a greater influence was observed for respondents residing in Northern Taiwan compared to those in Central and Southern Taiwan. This is most likely because the lifestyle in Central and Southern Taiwan is more relaxed and not as busy as that in the north of Taiwan. People who rely heavily on the Internet for all matters use online WOM to gather information, and they consider this to be an ideal life tool. The findings in this section indicate that levels of Internet usage in Taiwan differ significantly among areas of residence with different levels of urbanization.

Table 3. Difference analysis of gender and network behavior factors.

Factor	Gender	Count	Mean	Standard deviation	t-value
Trust	Male	130	3.0013	0.64550	1.218
	Female	144	2.9132	0.55082	
Reputation	Male	130	3.4865	0.59170	-1.262*
	Female	144	3.5712	0.51009	
Security	Male	130	3.1769	0.71015	2.916
	Female	144	2.9201	0.74365	
WOM	Male	130	3.2154	0.60161	0.268
	Female	144	3.1958	0.60278	
Privacy	Male	130	3.2590	0.53839	3.142*
	Female	144	3.0706	0.44319	
Web ease-of-use	Male	130	3.6600	0.64731	-0.560
	Female	144	3.7028	0.61587	
Overall	Male	130	3.2999	0.46981	1.342
	Female	144	3.2290	0.40461	

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Differences in Internet use experience and network behaviors

Here, the results of a *t* test and one-way ANOVA are detailed to explore the differences in the influence of network behavior factors among network users with varying levels of Internet experience. Regarding the network experience variable, three aspects were examined in this study: time spent online per day and use of multiple online accounts. Factors influencing network users' behaviors were examined based on the six dimensions of trust, reputation, security, WOM, privacy, and Web ease-of-use. The analysis results are detailed as follows:

(1) Time spent online per day: Numerous factors exhibited significant differences for influencing the behavior of network users according to the duration they spent online per day: trust ($F = 7.654^{***}$), reputation ($F = 4.847^{**}$), network security ($F = 3.052^*$), WOM ($F = 3.867^*$), privacy ($F = 2.915^*$), and Web ease-of-use ($F = 2.750^*$). Further analyses revealed that excluding Web ease-of-use, all other groups differed significantly, particularly the users who spent more than 6 h/day using

the Internet. These results indicate that the more time a user spends online, the more trust, reputation, network security, WOM, and privacy they demand. Possible reasons for these significant differences may be that (a) users' long-term reliance on the Internet has made them accustomed to network behavior patterns, to the point where there is no boundary between virtual and real worlds; hence, their trust in the Internet has been established; (b) users search for reputation information and evaluative comments on the Internet to compensate for their sense of uncertainty; (c) users place additional emphasis on network security because when using the Internet, the authenticity of online information is difficult to determine, and fraud and cheating occur frequently; (d) users observe and measure online WOM and transmission situations regularly; thus, they are influenced more by online WOM; and (e) compared to general users, experienced Internet users are less concerned about their privacy being breached or infringed upon.

(2) Users with multiple network accounts: No significant differences were observed in the factors influencing network user behavior regarding the use of multiple network accounts. Thus, network users use Internet

services according to their preferences and habits, and the number of network accounts they own does not cause differences in behavior.

DISCUSSION

By employing descriptive statistics, *t* tests, one-way ANOVA, and factor analysis, we explored the various factors affecting user behavior during various network activities in the context of network users in Taiwan. Most studies related to network user behavior have focused on the influence of individual factors. By contrast, this study adopted a holistic factor analysis to investigate the correlations among various factors. We classified network behaviors based on the six dimensions of namely trust, reputation, security, WOM, privacy, and Web ease-of-use. Subsequently, among these influential factors, was conducted and it was discovered that reputation and WOM were of the same type and that network security included privacy. Therefore, the factors influencing online user's behavior could be reduced to four items, that is, trust, reputation, security, and Web ease-of-use. The results of this study may provide suitable decision-making criteria for enterprises when designing marketing plans and promotions in online environments, and they provide criteria for researchers conducting further study in this field.

Conclusion

Considering the geographical restrictions, in this study, we adopted a convenience sampling method to collect data because random sampling was not possible. However, the convenience sampling method does not guarantee that all samples possess an equal likelihood of being selected for participation; whether a certain portion of the population or a specific group was excluded remains unknown. Therefore, we recommend that future studies use a larger sample to improve the precision and representativeness of the results. All factors influencing user behaviors in this study were measured using positive indicators. Negative factors, such as risks, cyber-bullying, or Internet indulgence, should be included in future studies to assess the effects of both the positive and negative factors on user behavior to enhance the comprehensiveness of current research in this field.

Conflict of Interest

The authors have not declared any conflict of interest.

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