



Relationships among personality traits, Facebook usages, and leisure activities – A case of Taiwanese college students



Tingya Kuo^a, Hung-Lian Tang^{b,*}

^a Chung Hwa University of Medical Technology, Tainan, Taiwan

^b Eastern Michigan University, Ypsilanti, MI 48197, USA

ARTICLE INFO

Article history:

Keywords:

Personality
Facebook usages
Leisure activities

ABSTRACT

With 1.11 billion active users worldwide, Facebook usages may have some impacts on our social lives. The purpose of this research is to investigate possible relationships among personality traits, Facebook usages, and leisure activities. Three hypotheses were proposed: users with different personality traits may have different Facebook usages, users with different personality traits may have different leisure activities, and users with different Facebook usages may have different leisure activities. A questionnaire with 30 items was developed and the convenient sampling technique was used to collect data from 500 college students in Taiwan. Statistics methods such as descriptive statistics, independent *t* tests, ANOVA were used to analyze the data with a statistical significance of $p < .05$. The hypotheses were partially supported. Participants with high extraversion, low agreeableness and high openness tended to spend more times on Facebook and have more number of friends and photos. The findings confirmed that high extraversion and high openness people liked to socialize on Facebook (more time, more friends, more photos) also liked to socialize in real life (more time on team sports and recreational activities), but low agreeableness and low emotional stability people liked to use Facebook for socializing in lieu of real life socializing.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Individual usages of Internet applications have been experiencing lots of changes since the introduction of the first web browser in early 90s. A decade later, some application developers created applications that allow individuals to create and share their personal interests with others on the Internet (i.e. blogging, wikis, and social networking). One of the most popular social networking sites is Facebook. Facebook had around 1.2 million active users in 2006, but today it has 1.11 billion active users worldwide by the end of March 2013 (Facebook, 2013). Such a humongous amount of users' information and contents generated by Facebook's users have attracted scholars from various research disciplines to conduct researches with different perspectives. Some researchers investigated the relationship between personality traits and Facebook usages (Amichai-Hamburger & Vinitzky, 2010; Ross et al., 2009; Ryan & Xenos, 2011), and some researchers studied differences of personal information sharing (Ellison, Steinfield, & Lampe,

2007; Pempek, Yermolayeva, & Calvert, 2009; Smith & Caruso, 2010).

According to the American Time Use Survey data from 2003 to 2011, average daily time for leisure and sport activities has been around 5 h; however, average time for playing games and computer use for leisure has increased from 18 min in 2003 to 26 min in 2011 for all ages (Bureau of labor statistics, 2012). Obviously, increase of time use for playing games and computer use for leisure would decrease the time use for other leisure activities (Robinson, 2011). In addition, individual choices of leisure activities may be influenced by many factors such as age, gender, education, income, and personality traits (Lu & Hu, 2005).

There are researches about the relationship between personality traits and Facebook usages, and personality traits and leisure activities, but there is no research about possible relationships among personalities, Facebook usage and leisure activities. In addition, Facebook was officially introduced to Taiwan in 2009 with around 205 thousand users, but it has reached 13.24 million users by the end of 2012, with a penetration rate of 76% of Internet users, which is higher than the U.S. penetration rate of 67.7% (Internet World Stats, 2013). Therefore, it is worthwhile to study possible relationships among Taiwanese college students' personality traits, Facebook usage, and leisure activities.

* Corresponding author. Address: Department of Computer Information Systems, Eastern Michigan University, 300W. Michigan Ave., Ypsilanti, MI 48197, USA. Tel.: +1 (734) 487 2454.

E-mail addresses: n97b0004@stust.edu.tw (T. Kuo), htang@emich.edu (H.-L. Tang).

1.1. Facebook usage

Facebook allows individuals to meet with people with similar interests and connect with their friends on their social networks (Haythorhwaite, 2005). To create a Facebook account, an individual has to create a profile with demographic data and relational data, and the humongous amount of data from users' profiles has created a fertile and attractive source of data for researchers (Boyd & Ellison, 2007).

The increasing popularity of Facebook have some impacts on friendship, information sharing and leisure activities (Amichai-Hamburger & Hayat, 2011). According to the EDUCAR annual survey of undergraduate students' use of information technology, the percentage of students who use social network sites has increased from 81.6% in 2007 to 90.4% in 2010 (Smith & Caruso, 2010) and students used social network sites to connect with friends, share photos, find out more about people, communicate with classmates and plan or invite people to events. Hew (2011) discovered that most students used Facebook to maintain existing relationships and to meet new people, but not for educational purpose. On average, students spent about 10–60 min daily on Facebook and had 200–350 friends.

Ross et al. (2009) studied possible influence of personality on Facebook use and discovered different personality types did use different aspects of Facebook. For instance, people with high extraversion joined more groups, people with high neuroticism liked to use the Facebook's Wall, and people with high openness liked to be socialable on Facebook.

1.2. Leisure activities

Leisure activities can be classified by various patterns. There is continuity in leisure patterns across the life span (Iso-Ahola, 1980) and Scott and Willits (1998) classified leisure activities into 5 categories: (1) socializing with friends or relatives, (2) participating in creative or artistic activities, (3) reading or studying, (4) participating in sports, and (5) participating in fraternal or community organizations.

Hultsch, Hertzog, Small, and Dixon (1999) categorized leisure activities into 6 activity scales: physical, social, self-maintenance, passive information processing, integrative information processing, and novel information processing. The activity scales were later expanded to 11 scales: physical, crafts, games, TV, social-private, social-public, religious, developmental, experiential, technology, and travel (Jopp & Hertzog, 2010).

American time use survey (Bureau of labor statistics, 2012) divided leisure and sports activities into 7 activity scales: (1) participating in sports, exercise and recreation, (2) socializing and communicating, (3) watching TV, (4) reading, (5) relaxing/thinking, (6) playing games and computer use for leisure, and (7) other leisure and sports activities, including travel. According to the 2011 survey, total average leisure and sports time for Americans was 5.19 h per day, which consisted of 18 min of participating in sports, exercise and recreation, 42 min for socializing and communicating, 2.75 h for watching TV, 18 min for reading, 18 min for relaxing and thinking, 26 min for playing games and using computer for leisure, and 25 min for other leisure activities. Overall, the times used for watching TV and playing games and using computer for leisure had increased, but the times used for socializing and reading had decreased since 2003.

Japan has a similar survey on time use and leisure activities every five year (Japan Statistics Bureau, 2006). It classifies the leisure activities into 6 activity scales: (1) Internet use, (2) studies and researches, (3) sports, (4) hobbies and amusements, (5) volunteer activities and (6) Travel and excursions.

Brajsa-Zganec, Merkas, and Sverko (2011) identified 15 leisure activities of Croatian citizens and classified them into three leisure scales: (1) active socializing and going out (playing sports, going to cafes, clubs or pubs; attending sport events; and dining in restaurants), (2) visiting cultural events (visiting exhibitions; going to theatres; reading books; attending concerts; going to the movies; going to excursions or field trips; engaging in some particular hobby), and (3) family and home activities (visiting friends and relatives; shopping; going to the church; watching TV).

Munson and Widmer (1997) used the following leisure activity scales to study college students' leisure activities: arts and hobbies, games and sports, music, reading, social, thinking, and television. They discovered that a positive correlation between, intellectual leisure activities such as thinking, reading and occupational identity.

1.3. Personality

The Big Five Factors Model is one the most commonly used model for measuring personality traits. The model classifies personality into five types: openness, conscientiousness, extraversion, agreeableness, and emotional stability (McCrae & John, 1992).

Several instruments are available for measuring the Big Five Factors. The number of items ranges from 240 items to 10 items (Costa & McCare, 1992; Goldberg, 1992; Gosling, Rentfrow, & Swann, 2003; John & Srivastava, 1999). Though the longest one is comprehensive, but responders may have negative feeling due to its length. Gosling et al. (2003) developed a 10-item personality inventory (TIPI) instrument, which is suitable for a research with main focus on relationship between personality traits and other constructs (Correa, Hinsley, & de Zúñiga, 2010).

1.4. Personality and Facebook usage

There are many researches about possible relationship between personality traits and online activities, but the findings are inconsistent and inconclusive (Amichai-Hamburger & Vinitzky, 2010; Correa et al., 2010; Ebeling-Witte, Frank, & Lester, 2007; Guadagno, Okdie, & Eno, 2008; Landers & Lounsbury, 2006; Ryan & Xenos, 2011; Tosun & Lajunen, 2010).

Amichai-Hamburger and Vinitzky (2010) discovered a strong link between personality and Facebook uses. Extraversion person had more friends and groups, neuroticism person showed more personal information and use private messages, agreeableness person liked to post more pictures, openness person used more features and conscientiousness person had more friends but less pictures loaded in the Facebook.

Correa et al. (2010) found that extraversion and openness people liked to use social media, but neuroticism people disliked using social media, however, other studies showed that neuroticism people liked to use instant messaging, blogging, and talking and making friends online (Ebeling-Witte et al., 2007; Guadagno et al., 2008). Tosun and Lajunen (2010) explained that psychoticism individuals used the Internet as a substitution of face-to-face communication, but extraversion people used the Internet as an extension of social connection.

Landers and Lounsbury (2006) found that agreeableness, conscientiousness, and extraversion people disliked Internet usage. Ryan and Xenos (2011) found that Facebook users were likely to be extraverted, but less conscientious.

1.5. Personality and leisure activities

Extraversion people liked competitive leisure activities such as team sports, psychoticism people liked combative leisure activities and neuroticism people liked hobbies (Furnham, 1981; Hills &

Argyle, 1998). Lu and Hu (2005) found that extraversion people were interested in all leisure activities, but neuroticism people showed little interest in any leisure activity.

Jopp and Hertzog (2010) found that agreeableness people liked watching TV, religious activities, experiential activities and social-public activities, but disliked crafts, physical activities and developmental activities. Openness people disliked religious activities, but liked developmental activities and technology.

1.6. Present study

The above researches supported relationships between personality and leisure activities, and between personality and Facebook, but a search on the ScienceDirect database using “personality, leisure activity, social network” as key words resulted in no articles. Two articles were found with the key words “personality, leisure, Internet”. One article (Leung & Lee, 2005) found that socializing online would decrease the quality of life, but participating in community or religious activities for leisure would improve the quality of life. The other article (Whitty & McLaugulin, 2007) found that lonely people used Internet for entertainment or getting information about the entertainment world, but high Internet self-efficacy people used Internet for entertainment or facilitating off-line entertainment.

This study examined possible relationships between personality traits and Facebook usages, personality traits and leisure activities, and Facebook usages and leisure activities. Three hypotheses were developed.

1. Different personality traits influence individuals' Facebook usages.
2. Different personality traits influence individuals' leisure activities.
3. Different Facebook usages influence leisure activities.

2. Method

2.1. Participants

500 Students at a university in Taiwan participated in the present study with valid sample of 441 students (349 females, 92 males). Among 441 students, 100 students were freshmen (22.7%), 126 students were sophomore (28.6%), 145 students were junior (32.9%), 66 students were senior (15%), and 4 students were graduate (0.9%).

2.2. Materials

A 30-item research questionnaire was designed to collect data about basic demographic data (4 items), personality traits (10 items), Facebook usages (10 items) and leisure activities (6 items).

To avoid negative feeling of using lengthy instrument, the TIPI (Ten-Item Personality Inventory) instrument (Correa et al., 2010; Gosling et al., 2003) was used to assess the Big Five personality traits about openness (open to new experiences, complex vs. conventional, uncreative), conscientiousness (dependable, self-disciplined vs. disorganized, careless), extraversion (extraverted, enthusiastic vs. reserved, quite), Agreeableness (sympathetic, warm vs. critical, quarrelsome), and emotional stability (anxious, easily upset vs. calm, emotionally stable). The instrument used a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Ellison et al. (2007) developed a Facebook intensity scale to measure Facebook usages. The Facebook intensity scale includes average time per day, the number of friends and 6 additional items about users' connection and attachment with the Facebook. Ross

et al. (2009) designed an instrument with 28 items about Facebook usages, attitudes, and user profiles. Ryan and Xenos (2011) designed an instrument with 18 items about Facebook usages and preferred Facebook features. This research used the Facebook intensity scale and Facebook's attitudes from the above researches. The Facebook intensity scale used the Likert scale of 1–6 to measure the experience (1: <1 month, 2: 1–6 month, 3: 6 month–1 yr, 4: 1–2 yrs, 5: 2–3 yrs, 6: >3 yrs), daily time use (1: <10 min, 2: 10–30 min, 3: 31–60 min, 4: 1–2 h, 5: 2–4 h, 6: >4 h), weekly time use (1: <2.5 h, 2: 2.5–5 h, 3: 5–10 h, 4: 10–20 h, 5: 20–40 h, 6: >40 h), the number of friends (1: <10, 2: 10–50, 3: 51–100, 4: 101–200, 5: 201–300, 6: >300), the number of photos (1: <50, 2: 50–100, 3: 101–200, 4: 201–300, 5: 301–400, 6: >400), and the number of groups (1: <5, 2: 5–10, 3: 11–20, 4: 21–40, 5: 41–60, 6: >60). The attitudinal questions used the Likert scale of 1–5 (1 = strongly disagree to 5 = strongly agree) to measure the attitudes toward Facebook, which included: Facebook is part of my daily activities, I am proud of telling others that I am on Facebook, I feel lost if I have not used Facebook for a while, and I feel I am part of the Facebook community.

The American Time Use Survey (Bureau of labor statistics, 2012) has 7 categories of leisure and sport activities (participating in sports, exercise and recreation, socializing and communicating, watching TV, reading, relaxing/thinking, playing games and computer use for leisure, other leisure and sports activities). However, sport and leisure activities can be further classified by team or individual, and indoor or outdoor. Previous researches (Furnham, 1981; Hills & Argyle, 1998; Jopp & Hertzog, 2010; Lu & Hu, 2005) showed that personality influenced individual preferences of team vs. individual sports, or indoor vs. outdoor sports. Therefore, the authors reorganized these leisure and sport activities with six different categories that included team sport activities (basketball, baseball, volleyball, football, tennis, golf, etc.), fitness activities (swimming, aerobic, gym, yoga, running, etc.), outdoor leisure activities (bicycling, skateboarding, camping, fishing, climbing, sightseeing, etc.), recreation activities (shopping, watching TV or movies, socializing with friends or chatting online, playing online games, etc.), intellectual activities (reading, writing, etc.) and artistic activities (music, art, etc.). Instead of collecting actual times participated in these activities, the intensity scale similar with the Facebook intensity scale (Ellison et al., 2007) was used to measure the extent of participation (1: no participation, 2: 1–9 min, 3: 10–30 min, 4: 31–60 min, 5: 1–2 h, 6: 2–4 h, 7: >4 h).

2.3. Procedure

Due to high Facebook's penetration rate of 76% in Taiwan, a convenient sampling method was used to collect data. 500 Hard copies of the questionnaire were distributed to students in various classrooms, with 441 valid data sets. SPSS was used to analyze the data sets with item analysis, descriptive statistics, factor analysis, independent *t*-test, and ANOVA analysis.

In TIPI scale, each personality trait has two items, one with standard meaning and one with opposite meaning (i.e. Extraversion: extraverted, enthusiastic vs. reserved, quiet), therefore, the item with opposite meaning has to be recoded reversely, and then average the standard item's score with the reversed-scored item (Gosling et al., 2003).

3. Results

Consistent with a previous research (Gosling et al., 2003), the mean of extraversion was 4.24 with standard deviation of 1.26, the mean of agreeableness was 4.98 with standard deviation of .92, the mean of conscientiousness was 4.98 with standard

deviation of .92, the mean of emotional stability was 4.31 with standard deviation of 1.06, and the mean of openness was 5.02 with standard deviation of 1.07.

The Facebook usage's scale had a Cronbach's alpha value of .876 with good internal consistency, and was consistent with a previous research (Cronbach's alpha value = .83) (Ellison et al., 2007). Among 6 Facebook intensities, the number of friends had the highest mean ($M = 3.85$, $S = 1.550$) with an average of 185 friends, daily time use was second ($M = 3.27$, $SD = 3.27$) with an average of 75 min a day, and the number of groups had the lowest mean ($M = 1.35$, $SD = .758$) with average of 7 groups, and the rest were Facebook experience ($M = 3.21$, $SD = 1.243$), weekly time use ($M = 2.88$, $SD = 1.618$), number of photos ($M = 1.90$, $SD = 1.471$). Among the 4 Facebook attitudes, "Facebook is part of my daily activities" had the highest mean ($M = 3.39$, $SD = 1.266$) and "I feel lost if I have not used Facebook for a while" had the lowest mean ($M = 3.02$, $SD = 1.218$) and the rest were "I feel I am part of the Facebook community" ($M = 3.29$, $SD = 1.012$) and "I am proud of telling others I am on Facebook" ($M = 3.19$, $SD = 1.058$). Overall, users felt connected with Facebook.

Among 6 leisure activities, recreation activities had the highest mean ($M = 5.17$, $SD = 1.534$) with an average of 2.34 h and team sports had the lowest mean ($M = 2.27$, $SD = 1.494$) with an average of 11 min. The mean scores of other activities were: intellectual activities ($M = 3.34$, $SD = 1.396$), artistic activities ($M = 2.73$, $SD = 1.720$), outdoor leisure activities ($M = 2.52$, $SD = 1.675$), fitness ($M = 2.35$, $SD = 1.410$). It was surprised to learn that most participants spent a lot of times on recreational activities such as watching TV or movies, socializing with friends, chatting online, and playing online games (41.5% of users spent 1–4 h a day and 26.3% of users spent more than 4 h a day), 59.5% users spent 10–60 min on intellectual activities, but the majority of users spent less than 10 min a day on physical activities (team sports, fitness, outdoor leisure) and artistic activity and around 40% of users did not participate in any physical activities at all. The time spent on recreation activities were consistent with the time reported on the American Time Use Survey (Bureau of labor statistics, 2012). On average, Americans spent 3.9 h on recreation activities (2.75 h on watching TV, 42 min on socializing, and 26 min on playing games or computer use for leisure). The results confirmed that people spent most of their leisure time on recreation activities but significant less time on physical and artistic activities.

With smaller sample size due to convenient sampling, the personality traits were divided into thirds by the sorted scores, and only the highest third group and the lowest third group were used for hypotheses testing (Ross et al., 2009). Therefore, independent t test was used to test the independence between the low third group and the high third group in terms of Facebook intensity. Both hypothesis 1 and 2 were divided into 5 sub-hypotheses of personality traits.

Table 1 summarized t values of Facebook usages between people with low and high personality traits. A negative t value means high personality trait people had a higher intensity than low personality trait people, and a positive t value means low personality trait people had a higher intensity than high personality trait people.

High extraversion people were significantly different from low extraversion people in all Facebook usages. High extraversion people felt they were more connected with Facebook than low extraversion people in all 4 attitudes (i.e. Facebook is part of my daily activities, I am proud of telling others I am on Facebook, I feel lost if I have not used Facebook for a while, and I feel I am part of the Facebook community). High extraversion people had longer Facebook experience, daily time use and weekly time use, and more number of friends, photos, and groups than low extraversion people.

High agreeableness people were not significantly different from low agreeableness people in all 4 attitudes, Facebook experience, the number of friends and the number of groups because they preferred not to express their individual opinions. Low agreeableness people had longer daily time use and weekly time use, and more number of photos than high agreeableness people. One possible explanation was that people preferred to communicate with low agreeableness people online due to difficulty of communicating with them in person.

High conscientiousness people's attitudes toward Facebook were not significantly different from low conscientiousness people's attitudes. High conscientiousness people were not significantly different from low conscientiousness people in any Facebook usages because they were cautious and conservative about online activities and preferred not to tell others about their Facebook usages.

Low emotional stability people spent more time a day, and had higher number of friends and photos than high emotional stability people. Low emotional stability people felt that Facebook was part of my daily activities and felt lost if they had not used Facebook for a while. However, there were no significant differences between high emotional stability people and low emotional stability people in two attitudes (I am proud of telling others I am on Facebook, I feel I am part of the Facebook community) and in Facebook experience, weekly time use, and the number of groups. Low emotional stability people did not tell others about their participation in Facebook community because they really did not have any friend in real life.

High openness people also felt they were more connected with Facebook than low openness people in 3 attitudes except the attitude "Facebook is part of my daily activities". High openness people spent more time weekly and had more number of friends and photos than low openness people. However, there were no significant differences in Facebook experience, daily time use, and the number of groups, because they were too busy in exploring new activities, so they did not have enough daily time of using Facebook and did not join lots of groups.

Table 2 summarized t values of leisure activities between people with low and high personality traits. A negative t value means high personality trait people spent more time on a leisure activity than low personality trait people, and a positive t value means low personality trait people spent more time on a leisure activity than high personality trait people.

It was interesting to see that people with high scores of all personality types were significantly different from people with low scores in outdoor leisure activities, but not significantly different in recreational activities. One possible explanation was that recreation activities were part of every one's daily activities regardless of personality types. High extraversion people were not significant different from low extraversion people in all leisure activities except outdoor leisure activities, because they were too busy to have time for leisure activities. High agreeableness people spent more time on outdoor leisure activities and intellectual activities than low agreeableness people, but there were no significant differences in team sports, fitness, recreation, and artistic activities because they liked to improve their knowledge through intellectual activities. High conscientiousness people spent more time on fitness and outdoor leisure activities than low conscientiousness people, but there were no significant differences in team sports, recreation, intellectual, and artistic activities, because they cared about their images, so they spent more time on fitness, but not on other leisure activities. High emotional stability people spent more time on fitness and outdoor leisure activities than low emotional stability people, but there were no significant differences in team sports, recreation, intellectual, and artistic activities, because they cared about their appearances. High openness people spent more time

Table 1Independent *t* test between personality and Facebook usages.

	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness
Facebook is part of my daily activities	–2.133*	.611	–.088	2.280*	–1.719
I am proud of telling others I am on Facebook	–3.463**	.124	.233	1.162	–3.284**
I feel lost if I have not used Facebook for a while	–3.140*	1.649	.474	2.103*	–2.289*
I feel I am part of the Facebook community	–4.338***	.343	–.344	1.380	–2.647**
Facebook Experience	–2.133*	.842	.425	1.419	–1.294
Daily time use	–3.053**	2.343*	1.249	2.578*	–1.661
Weekly time use	–3.546**	2.790**	.375	1.898	–2.405*
The number of friends	–4.378***	1.755	1.555	2.686**	–3.332***
The number of photos	–4.904***	2.720**	.811	2.429*	–2.794**
The number of groups	–2.939*	1.227	.673	1.202	–1.696

* $p < .05$.** $p < .01$.*** $p < .001$.**Table 2**Independent *t* test between personality and leisure activities.

	Extraversion	Agreeableness	Conscientiousness	Emotional stability	Openness
Team sports	–1.477	.939	–1.466	–.752	–2.930**
Fitness	–1.622	–.826	–3.505***	–3.201***	–4.937***
Outdoor leisure	–2.646**	–2.574*	–3.771***	–2.631**	–2.679**
Recreation	.277	.179	1.438	.697	–.987
Intellectual	–.035	–2.367*	–1.554	–.994	–1.625
Artistic	–.636	–1.221	–.018	–.422	–2.688**

* $p < .05$.** $p < .01$.*** $p < .001$.

on team sports, fitness, outdoor leisure activities and artistic activities than low openness people, but there were no significant differences in recreation and intellectual activities, because they liked to enjoy new experiences and did not have time for intellectual activities.

The results could also be interpreted from the perspective of leisure participations. For team sports, only high openness people spent more time than low openness people, but people in other 4 personality traits were indifferent. For fitness, people with high conscientiousness, emotional stability and openness people spent more time than low conscientiousness, emotional stability and openness people, but people in extraversion and agreeableness were indifferent. For outdoor leisure activities, people with high scores in all 5 personality traits spent more time than people with low scores. For recreation activities, every one participated in recreation activities (watching TV, socializing, online chatting, and on-line gaming) regardless of personality traits. For intellectual activities, only high agreeableness people spent more time than low agreeableness people, but people in other personality traits were indifferent. For artistic activities, only high openness people spent more time than low openness people, but people with other personality traits were indifferent.

Hypothesis 3 tested possible influences of Facebook usages on leisure activities. ANOVA was used to analyze significant difference of a leisure activity due to different intensities of Facebook usages. Overall, fitness activities, outdoor leisure activities and artistic activities were not significantly dependent on any Facebook usage. Team sports participation was significantly influenced by Facebook experience and the number of friends, but not by daily time use, weekly time use, the number of photos and the number of groups. Recreation activities participation was significantly influenced by daily time use, weekly time use, and the number of photos, but not significantly influenced by Facebook experience, the number of friends and the number of groups. Intellectual activities participation was significantly influ-

enced by the number of friends, but not significantly influenced by all other Facebook usages.

For post-hoc tests of comparing pairwise means, Tukey's honestly significant difference (HSD) was the recommended method for means with equal variances (Rafter, Abell, & Braselton 2002; Zwick & Marascuilo, 1984), and Games Howell method was the recommended method for means with unequal variances (Tamhane, 1979; Toothaker, 1993). Therefore, Tukey's honestly significant difference (HSD) post-hoc test was applied to those with significant F scores (homogeneity of variances), but Games Howell test was applied to those with significant Levene test scores (violation of homogeneity of variances). Table 3 summarized only the leisure activities with significant differences and post-hoc results of Facebook usage intensity (i.e. a Facebook usage is a factor and a leisure activity is a dependent variable).

People with longer Facebook experience (6 months–1 year > less than 1 month), longer daily time use (31–60 min > less than 10 min), and more number of friends (more than 200 > less than 10, more than 300 > 50–199) would spend more time on team sports. People with longer daily time use (2–4 h > less than 10 min, 2–6 h > 10–30 min), longer weekly time use (20–40 h > less than 5 h) and more number of photos (more than 400 > less than 50) would spend more time on recreational activities. In other words, people who spent more time on Facebook and had lots of friends and photos on Facebook were people who liked to socialize in real life, therefore, they spent more time on team sports and recreational activities.

People with shorter daily time use (less than 1 h > 2–4 h) would spend more time on fitness. People with less number of friends (10–49 > 200–300) would spend more time on intellectual activities. In other words, people who spend less time and had less friends on Facebook would prefer individual leisure activities such as fitness and intellectual activities.

Table 3
ANOVA tests of Facebook usages toward leisure activities.

Facebook usages	Leisure activities	Levene	ANOVA			
			Sig.	F	Sig.	Post Hoc
Facebook experience	Team sports	2.584*	.026	3.148**	.008	6 month–1 yr > less than 1 month
Daily time use	Team sports	2.726*	.013	2.282	.054	31–60 min > less than 10 min
	Fitness	2.386*	.028	2.082	.054	10–30 min > 2–4 h 31–60 min > 2–4 h
	Recreation	1.951	.071	4.390***	.000	2–4 h > less than 10 min, 2–4 h > 10–30 min, 4–6 h > 10–30 min
Weekly time use	Recreation	1.699	.133	3.753*	.002	20–40 h > less than 2.5 h, 20–40 h > 2.5–5 h
The number of friends	Team Sports	3.766	.002	4.838***	.000	200–300 > less than 10, more than 300 > less than 10, more than 300 > 50–99, more than 300 > 100–199
	Intellectual	3.421**	.005	2.356*	.040	10–49 > 200–300
The number of photos	Recreation	1.574	.166	2.469*	.032	More than 400 > less than 50
The number of groups						No significance on all activities

* $p < .05$.

** $p < .01$.

*** $p < .001$.

4. Discussions

The independent t test between personality traits and Facebook usages suggested that there were some dependencies of Facebook usages on personality traits. The findings about high extraversion and low emotional stability people had more friends were consistent with previous researches (Amichai-Hamburger & Vinitzky, 2010; Ryan & Xenos, 2011). The findings about high extraversion, low emotional stability and high openness people spent more time on Facebook were consistent with previous researches (Correa et al., 2010; Ryan & Xenos, 2011). However, this research also found that high openness people had more friends and photos; low agreeableness people spent more time and had more photos.

The independent t test between personality traits and leisure activities suggested that there were some dependencies of leisure activities on personality traits. However, the findings were inconsistent with previous researches (Furnham, 1981; Hills & Argyle, 1998; Jopp & Hertzog, 2010; Lu & Hu, 2005). In these researches, extraversion people liked team sports, agreeableness and openness people liked recreation activities, but this research did not support these findings. On the contrary, this research found that high openness people liked team sports, fitness activities, and artistic activities, and conscientiousness and emotional stability people liked fitness activities. People with high scores in 5 personality traits spent more times on outdoor leisure activities than those with low scores, but there were no significance difference in recreation activities for all 5 personality traits. One possible explanation was recreation activities were parts of every one's daily activities regardless of personality traits.

The ANOVA tests of dependencies of leisure activities on Facebook usages suggested that there were some dependencies of 4 leisure activities (team sports, fitness, recreational activities, and intellectual activities) on most Facebook usages (experience, daily time, weekly time, number of friends, number of photos) except the number of groups. The findings confirmed that people who like to socialize on Facebook (spent more time, had more friends, posted more photos) also like to socialize in real life (spent more time on team sports and recreational activities), but people spent less time and had less number of friends on Facebook would prefer to spend more time on intellectual activities such as reading and thinking.

The results from the three hypotheses tests showed possible connections among personality traits, Facebook usages, and leisure

activities. High extraversion people who spent 2–4 h a day, 20–40 h a week, and had more than 400 photos on Facebook would spend more time on recreational activities than low extraversion people. High extraversion people who had longer Facebook experience and more friends would spend more time on team sports. High openness people who spent more time a week would spend more time on recreational activities than low openness people. Low agreeableness and low emotional stability people who spent 2–4 h a day and had more than 400 photos on Facebook would spend more time on recreational activities than high agreeableness and high emotional stability people. One possible explanation is that low agreeableness and low emotional stability people had used Facebook as a surrogate of offline social activities. In other words, high extraversion and high openness people socialized both on Facebook (more time, more friends, more photos) and in real life (more time on team sports and recreational activities), but low agreeableness and low emotional stability people socialized only on Facebook.

4.1. Limitations and future research

Similar to other researches about Facebook usages, this research collected data from college students with the same age group and similar life style; therefore, the findings may not be generalized to other types of users. Due to similar life style, students may participate in similar leisure activities such as team sports and recreation activities. However, people from different demographic groups may have different Facebook usages and different leisure activities. A possible future research is to collect data from general public to discover additional connections between personality, Facebook usages and leisure activities.

The research findings were based on data collected from college students in Taiwan, but they may not be applicable to college students in U.S.A due to possible cultural influences on personality (Triandis & Suh, 2002). In addition, cultures may have some influences on Facebook usages and leisure activities. It is worthwhile to conduct a similar research in U.S.A, and compare possible culture differences between Taiwanese students and U.S.A. students in personality, Facebook usages and leisure activities.

This research does not examine on personality influences on Facebook usages then Facebook usages on leisure activities. In other words, the personal influences on leisure activities may be indirectly influenced by Facebook usages. Another possible suggestion for future research would be to examine the medication

effects of Facebook usages on leisure activities. Structural equation modeling would be recommended to explore possible mediation effects.

Possible personality influences on certain aspects of Facebook usages, such as daily time use, weekly time use, the number of photos, the number of friends and the number of groups were identified. It would be interesting to explore possible influences of personality on choices of Facebook features or functions, and privacy settings.

People have different working time preferences, and they may also have different time preferences for using Facebook and participating in leisure activities. Another direction for future research is to investigate possible personality influence on Facebook time preferences and leisure time preferences, and their possible impacts on choices of Facebook usages and leisure activities.

Hypothesis 3 showed positive relationship between time use on Facebook and recreation activities (shopping, watching TV or movies, socializing with friends or chatting online, playing online games, etc.), but the survey did not collect time uses of individual recreational activities. It would be worthwhile to explore possible relationship between Facebook time use and these individual activities.

Overall, this research contributes to the understanding of possible connections among personality traits, Facebook usages and leisure activities. This type of research is relevant to an ever-increasing trend of spending more time on social networking sites than offline leisure activities.

References

- Amichai-Hamburger, Y., & Hayat, Z. (2011). The impact of the Internet on the social lives of users: A representative sample from 13 countries. *Computers in Human Behavior*, 27(2011), 585–589.
- Amichai-Hamburger, Y., & Vinitzky, G. (2010). Social network use and personality. *Computers in Human Behavior*, 26(2010), 1289–1295.
- Boyd, D., & Ellison, N. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1), 210–230.
- Brajsa-Zganec, A., Merkas, M., & Sverko, I. (2011). Quality of life and leisure activities: How do leisure activities contribute to subjective well-being? *Social Indicators Research*, 102, 81–91.
- Bureau of labor Statistics, (2012). American time use survey-2003–2011 results, retrieved on May10, 2013. <<http://www.bls.gov/news.release/pdf/atus.pdf>>.
- Correa, T., Hinsley, A., & de Zúñiga, H. (2010). Who interacts on the Web? The intersection of users' personality and social media use. *Computers in Human Behavior*, 26(2010), 247–253.
- Costa, P., & McCare, R. (1992). *Revised NEO Personality Inventory (NEO-PI-R) and NEO Five-Factor Inventory (NEO-FFI) professional manual*. Odessa, FL: Psychological Assessment Resources.
- Ebeling-Witte Frank, M., & Lester, D. (2007). Shyness, internet use, and personality. *Cyber Psychology and Behavior*, 10(2007), 713–716.
- Ellison, N., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "Friends": Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12(4), 1143–1168.
- Facebook, 2013, Facebook statistics, retrieved on May 10, 2013. <<http://newsroom.fb.com/Key-Facts>>.
- Furnham, A. (1981). Personality and activity preference. *British Journal of Social Psychology*, 20, 57–68.
- Goldberg, L. (1992). The development of markers for the Big-Five factor structure. *Psychological Assessment*, 4, 26–42.
- Gosling, S., Rentfrow, P., & Swann, W. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality*, 37, 504–528.
- Guadagno, R., Okdie, B., & Eno, C. (2008). Who blogs? Personality predictors of blogging. *Computers in Human Behavior*, 24, 1993–2004.
- Haythorwaite, C. (2005). Social networks and Internet connectivity effects. *Information, Communication, & Society*, 8(2), 125–147.
- Hew, K. (2011). Students' and teachers' use of Facebook. *Computers in Human Behavior*, 27(2011), 662–676.
- Hills, P., & Argyle, M. (1998). Musical and religious experiences and their relationship to happiness. *Personality and Individual Differences*, 25, 91–102.
- Hultsch, D., Hertzog, C., Small, B., & Dixon, R. (1999). Use it or lose it: Engaged lifestyle as a buffer of cognitive decline in aging? *Psychology and Aging*, 14, 245–263.
- Internet World Stats (2013), Internet Usage in Asia, retrieved on May 10, 2013. <<http://www.internetworldstats.com/stats3.htm#asia>>.
- Iso-Ahola, S. (1980). Toward a dialectic social psychology of leisure and recreation. In S. Iso-Ahola (Ed.), *Social Psychological Perspectives on Leisure and Recreation*. Springfield, IL: Charles C. Thomas.
- Japan Statistics Bureau, (2006), 2006 Survey on time use and leisure activities, retrieved on April 11, 2011. <<http://www.stat.go.jp/english/data/shakai/index.htm>>.
- John, O., & Srivastava, S. (1999). The Big Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of Personality: Theory and Research*. New York: Guilford Press.
- Jopp, D., & Hertzog, C. (2010). Assessing adult leisure activities: An extension of a self-report activity questionnaire. *Psychological Assessment*, 22(1), 108–120.
- Landers, R., & Lounsbury, J. (2006). An investigation of Big Five and narrow personality traits in relation to Internet usage. *Computers in Human Behavior*, 22(2006), 283–293.
- Leung, L., & Lee, P. (2005). Multiple determinants of life quality: The roles of Internet activities, use of new media, social support, and leisure activities. *Telematics and Informatics*, 22, 161–180.
- Lu, L., & Hu, C. (2005). Personality, leisure experiences and happiness. *Journal of Happiness Studies*, 6, 325–342.
- McCrae, R., & John, O. (1992). An introduction to the five-factor model and its applications. *Journal of Personality*, 60, 175–215.
- Munson, W., & Widmer, M. (1997). Leisure behavior and occupational identity in university students. *The Career Development Quarterly*, 46(2), 190–198.
- Pempek, T., Yermolayeva, Y., & Calvert, S. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, 30(2009), 227–238.
- Rafter, J., Abell, M., & Braselton, J. (2002). Multiple comparison methods for means. *SIAM Review*, 44(2), 259–278.
- Robinson, J. (2011). IT use and leisure time displacement. *Information, Communication & Society*, 14(4), 495–509.
- Ross, C., Orr, E., Sisic, M., Arseneault, J., Simmering, M., & Orr, R. (2009). Personality and motivations associated with Facebook use. *Computer in Human Behavior*, 25(2009), 578–586.
- Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage. *Computers in Human Behavior*, 27(2011), 1658–1664.
- Scott, D., & Willits, K. (1998). Adolescent and adult leisure patterns: A reassessment. *Journal of Leisure Research*, 30(3), 319–330.
- Smith, S., & Caruso, J. (2010). *The ECAR Study of Undergraduate Students and Information Technology*, 2010. Boulder, Colorado: EDUCAUSE Center for Applied Research.
- Tamhane, A. (1979). A comparison of procedures for multiple comparisons of means with unequal variances. *Journal of the American Statistical Association*, 74(366), 471–480.
- Toothaker, L.E. (1993). *Multiple Comparison Procedures*. Sage University Paper Series on Quantitative Applications in the Social Sciences, 07-089. Newbury Park, CA: Sage.
- Tosun, L., & Lajunen, T. (2010). Does Internet use reflect your personality? Relationship between Eysenck's personality dimensions and Internet use. *Computers in Human Behavior*, 26(2010), 162–167.
- Triandis, H., & Suh, E. (2002). Cultural influences on personality. *Annual Review of Psychology*, 53, 133–160.
- Whitty, M., & McLaugulin, D. (2007). Online recreation: The relationship between loneliness, Internet self-efficacy and the use of the Internet for entertainment purposes. *Computers in Human Behavior*, 23(9), 1435–1446.
- Zwick, R., & Marascuilo, L. (1984). Selection of pairwise multiple comparison procedures for parametric and nonparametric analysis of variance models. *Psychological Bulletin*, 95(1), 148–155.