

行政院國家科學委員會專題研究計畫 期末報告

以計劃行為理論探討性別與行動科技產品陽剛特性對消費者使用意圖之影響---以智慧型手機為例(GM02)

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中文摘要： 隨著無線通訊設備以及相關行動服務市場之發展，人們已能在日常生活或工作中，在不受時間和地點的侷限下，以行動設備如手機或 PDA 等進行工作、處理商業或學習等行為。然而，透過行動設備進行行動商務或數位學習的前提，均須在使用者擁有且使用行動設備的情形下，因此探討影響消費者行動設備之使用因素有其必要性。雖然消費行為，似乎是一個理性的行為，但其行為仍受使用者個別特徵的影響，性別反映使用者對行為的詮釋，因此本研究試圖以理性計畫行為理論為出發點，探討使用者認知行動設備陽剛特性在其使用行為的影響。

本研究透過問卷進行實證，由於探討的主題與性別有關，為了更進一步了解性別在其中的影響，本研究不將研究重點放在少數使用科技之女性，而選擇探討科技中隱含性別的陽剛特性之影響，以釐清性別意義可能產生的隱含影響。而關於行動科技產品，由於手機使用普遍性高，且許多智慧型手機也已包含 PDA 功能與相關通訊功能，提供使用者進行行動商務或學習，因此本研究將以智慧型手機為研究標的。透過文獻探討，本研究發展出量測問卷並進行問卷前測，之後進行資料之蒐集。本研究共蒐集 165 份有效問卷，並以 PLS 進行資料分析。分析結果顯示，消費者認知智慧型手機陽剛特性提升其對使用智慧型手機的科技態度評估與認知行為控制，進而影響其使用意圖與使用行為；雖然消費者認知智慧型手機陽剛特性也增加其認知之主觀規範，但主觀規範並未顯著增加使用者智慧型手機使用意圖。

關於本研究結果部分，在學術方面，雖然許多研究應用計畫行為理論探討人類行為，然而探討性別與科技部分影響的研究並不多，科技是現代社會中的重要工具，其重要性不只表現在實用價值上，還負載著它在社會文化中的價值意義，在性別與科技研究中，科技與陽剛特質間的關係具有其重要的核心位置，因此本研究結果將有助於釐清性別隱含在其中的影響，作為後續相關學術研究之參考。在國家社會方面，本研究從性別的角度探討影響消費者智慧型手機之使用因素，除了有助於相關行動服務推展外，並了解在社會文化環境中，性別對科技使用的衝擊，裨益於降低因性別產生在獲取、教育或參與高科技的情形，有助於未來降低或減緩數位落差的產生原因。在產業方面，從企業營運觀點來說，本研究衡量消費者感知的智慧型手機陽剛特性之影響，其結果有助於在產品設計與行銷方面參考，擴大未來使用市場。

中文關鍵詞： 計劃行為理論觀點、性別與科技、陽剛特性、智慧型手機使用

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英文關鍵詞：

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1. MOTIVATION AND RESEARCH OBJECTIVES

With the development of the internet and mobile technology, the market growth of smartphones has attracted attention. Although smartphones as general mobile phones allow users to contact other users, they have different characteristics from general mobile phones. First, they usually have large size of high-resolution touchscreens. And they allow the access of standard web pages through Wi-Fi and/or mobile broadband. Finally, users can install and use different applications on them (e.g. Litchfield, 2010; Wikipedia, accessed March 2012). Thus, smartphones facilitate people to solve ordinary problems in life or work through the convenience of different applications on them.

Gender has been shown of importance in users' adoption of technologies. According to the investigation of MIC (2009), the products of top year sales bought by male online are regarding computers and communication. Nonetheless, the products of top year sales bought by female online are textiles and up-market dress. In addition, in online auction, dress and clothing accessories are mostly preferred by female buyers, but computer hardware and software, PDA, mobile phones, and communication devices are mostly preferred by male buyers. The phenomena indicate the possible impact of gender in adopting the communication and information technologies of smartphones. It then raises the importance of understanding the influence of gender in users' use of smartphone.

With the development of mobile phones, it allows users to use e-commerce or e-learning services through the platform of smartphones, such as on App or Android. However, it needs users to own smartphones first before their use of the services. Gender has been shown of importance in users' technology adoption or use. Yet, limited studies explore the impact of gender in users' adoption of smartphones. Masculinity implies gender meaning. This study is therefore motivated to clarify the impact of masculinity of smartphones in users' use behavior.

The theory of planned behavior (TPB) receives its attention in IS research (e.g. Bhattacharjee, 2000). It provides a theoretical foundation in explaining human behavior (Ajzen, 1985; 1991). And it indicates the importance both attitude and other constructs, including subjective norms and perceived behavioral control, in individual behavior intention. This study then makes an empirical study based on the

theory. The clarification of this study facilitates to understand gender impact in acquiring ICT (information and communication technologies) and avoid further gender difference in attending e-commerce or educational e-learning opportunities.

2. LITERATURE BACKGROUND

2.1 The Theory of Planned Behavior

According to the theory of reasoned action (TRA), human behavior is affected by behavioral intention which is influenced by his/her attitude toward the behavior and subjective norms (Fishbein & Ajzen, 1975; 1980). Thus, human behavior is out of individuals' total volitional control. The theory does not include the factors of environment or resources that are important but out of individuals' self-determination (Ajzen, 1985; 1991). Thus, to increase the explanation and prediction of the theory of reasoned action, Ajzen (1985; 1991) proposes the theory of planned behavior (TPB) based on TRA.

To consider individuals' perceived impact of environment and resources in their behavior, Ajzen (1985, 1991) adds the construct of perceived behavioral control (PBC) to indicate the possible impact of actual limits in human behavior in TPB. Perceived behavioral control reflects important core assumptions of TPB; it considers the limits in real life and improves the explanation of TRA. The theory is then widely adopted in social psychology and applied in diverse research areas (Bhattacharjee, 2000; Chau & Hu, 2002). The model is shown in Fig. 1.

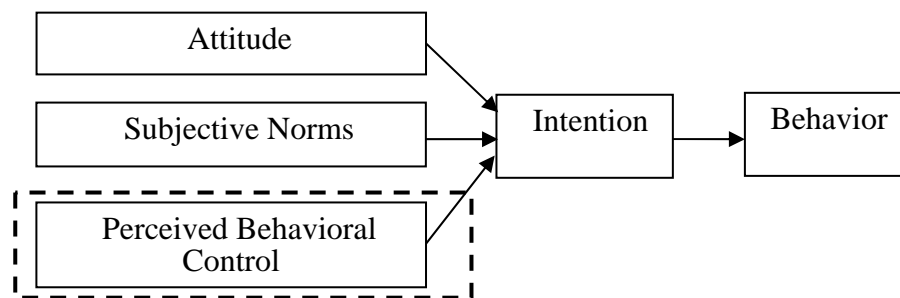


Fig. 1 The theory of planned behavior (TPB) (Ajzen, 1991)

According to TPB, the occurrence of human behavior is mainly decided by his/her intention. Behavior indicates individuals' reaction to goals in specific situation. And intention indicates the strength of individual willing to perform some activity; it is also usually adopted to predict and explain actual human behavior. In TPB, intention is affected by attitude, subjective norm, and perceived behavioral control.

TPB has received its attention in diverse research area (Armitage & Christian, 2003). With wide application of TPB in human behavior, this study adopts the theory in its investigation of consumers' use of smartphones.

2.2 The Impact of Perceived Masculinity of Smartphones

Self-concept refers to individuals' self-cognition about themselves. It indicates the way individuals see and treat themselves. It also reflects the overall view and feelings of individuals about themselves. Self-concept then plays the basis of individuals' self-identity forming, development, and change (Dusek, 1996; Sirgy, 1982).

According to the perspective of self-image congruence perspective, consumers show or express themselves through the things they buy or use (e.g. Jamal and Goode, 2001; Dolich, 1969; Graeff, 1996). When the image of products fits with consumers' self-concept, consumers purchase or use the products to define, maintain, and strengthen their self-concept (Birdwell, 1968; Grubb & Grathwohl, 1967; Grubb &

Hupp, 1968; Zinkham & Hong, 1991; Sirgy, 1982; Wallendorf & Arnould, 1988). Thus, consumers' purchase or use of things is affected by their self-image. Consequently, consumers like to purchase or use products that fit with their self-concept since products indicate the extension of their self-concept. And with the congruence of product image and consumers' self-concept, consumers gain psychological peace (Sirgy et al., 1997). When consumers do not like their true self and expect to become their ideal self, they can also enhance their cognition of self-concept through the purchase or use of the products that fit their ideal self.

In gender and technology research, the relatedness of technology and masculinity has its core impact (Grint & Gill, 1995, Han, 2010). Technology is an important instrument in modern society. Its importance is not only shown in practical use but also reflected by its social value meaning in the social culture, such as gender. Gender is a social structure which relates to the allocation of social resources and also indicates a model of practice in ordinary life. Masculinity and femininity are a structure of specific gender relationship. It indicates a practice structure of male and female in gender-related occasions. Therefore, masculinity reflects a gender relationship model in a social culture context of specific time and space. It is also a series of relationship interaction process of individuals in existed gender order (Connell, 1995; Han, 2010). Consequently, masculinity and femininity exist in history, economy, culture, and politics in tangible life. And when people try to conceptualize the meaning of masculinity and femininity, they need to consider these situations in the larger context of gender order relationship (Dasgupta, 2003; Han, 2010).

Connell (1995) deconstructs masculinities into hegemony, subordination, complicity, and marginalization. Among them, hegemony is a most widely acceptable form. It is collectively common consensus and consent, and mainly achieved through culture, institution, and persuasion that are agreed and participated by marginal people and subordinates (Connell & Messererschmidt, 2005). He indicates that hegemonic masculinity has also been an ideal gender practice configuration in the society (Connell, 1995). It provides the legitimacy of men to maintain their dominant position. It is a historically changed relationship, challenged and changing in different society in history (Mackinnon, 2003). Connell (1995) indicates that masculinities cannot exist alone; they are also power hierarchical. Thus, masculinity exists in different forms and is multiple.

Masculinity implies the impact of gender. Some scholars indicate that technology is a representation of masculine culture; it reflects human beliefs and desirability toward masculinity (Wajcman, 1991; Cockburn, 1992). Men's masculinity is defined by their proficiency of machines and technology, and women's femininity is defined by the lack of interest in machines and technology. Women are described as non-technological, dominated by men. Technology is then designed not to fit the needs of females. Men maintain their masculinity through their proficiency of machines and technology, and women maintain their femininity through their strangeness of machines and technology (Wajcman, 1991; Cockburn, 1992; Giant & Woolgar, 1997; Graeff, 1996; Birdwell, 1968; Grubb, 1965; Dolich, 1969; Jamal & Goode, 2001; Connell, 1995). Consequently, the proficiency of machines and technology reflects gender difference.

Consumers' purchase or adoption of products is related with the congruence of their self-image (Malhotra, 1988; Ericksen, 1996; Graeff, 1996; Birdwell, 1968; Grubb, 1965; Dolich, 1969; Jamal & Goode, 2001). The adoption or use of technology also implies gender, such as the connection of technology use and masculinity, and the connection of technology not use and femininity. However, few studies measure products masculinity to clarify the impact of gender in consumers' consumption or use behavior of technology. This study is then motivated to measure the masculinity of smartphones based on literatures, and clarify its impact to reflect the impact of gender in consumers' adoption of the technology in the social culture.

However, not all technology users obey the tradition of the connection of technology use and masculinity and the connection of technology not use and femininity in adopting technology. To further understand the impact of gender in technology adoption, this study does not focus on females who adopt and use technology, but focuses on the impact of masculinity that implies gender. And this study gathers data from both male and female users to understand the impact of perceived masculinity of smartphones in their adoption behavior.

2.3 Research Hypotheses

2.3.1 The impact on users' use intention on their use of smartphones

According to the theory of planned behavior (TPB), the occurrence of human behavior is mainly decided by his/her intention. Behavior indicates individuals' reaction to goals in specific situation. And intention indicates the strength of individual willing to perform some activity (Ajzen, 1991). Therefore, the hypothesis about the impact of users' use intention of smartphones on their use is proposed.

H1: Users' use intention of smartphones is significantly associated with their use of smartphones.

2.3.2 The impact on users' use intention of smartphones

TPB includes the construct of attitude to reflect individuals' valence regarding the behavior, and the construct of subjective norm to indicate the social impact, and it adds the construct of perceived behavioral control to clarify the influence that is out of individual autonomous control (Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980; Ajzen, 1985; 1991; Taylor & Todd, 1995; Hsu & Chiu, 2004; Leonard et al., 2004).

Smartphones, indicating the image of high-tech, are technology of increasing importance in practical life. Attitude reflects individuals' valence regarding the behavior (Ajzen, 1985; 1991). It is also shown of importance in human consumption behavior (Howard & Sheth, 1969; Engel et al., 1995; Nicosia, 1966). This indicates the possible influence of users' high-tech valence in adopting technology (Cockburn, 1992; Wajeman, 1991; Chen, 2012). This study thus clarifies the impact of users' attitude of high-tech on their use intention of smartphones. The hypothesis is proposed. And bases on TPB (Ajzen, 1985; 1991), the hypotheses about the impact of subjective norms and perceived behavioral control are also proposed.

H2: Users' high-tech attitude toward using smartphones is significantly associated with their use intention of smartphones.

H3: Users' subjective norms is significantly associated with their use intention of smartphones.

H4: Users' perceived behavioral control is significantly associated with their use intention of smartphones.

2.3.3 The impact of perceived masculinity

Gender is a social structure which is regarding social resources allocation and practice model of daily life. Masculinity is then a gender relationship model in specific time and space of the society; it indicates individuals' series of interactions process in specific gender order (Connell, 1995; Han, 2010; Chen, 2012). If gender differences are maintained through the proficiency of machines and technology, perceived masculinity of technology then implies the meaning of gender and possibly affects users' adoption of the technology.

Aarts and Dijksterhuis (2000a) indicate that the activation of goal-directed

behavior depends on goals and thus, automaticity triggers the occurrence of automatic behavior. In specific situation, when the same choice is often sought by individuals in their mind and is later actually implemented according to their decision, the association between mental representation and goal-oriented performance representation then appears (Bargh, 1990; Bargh & Gollwitzer, 1994). And when the association between mental representation and goal-oriented performance representation occurs often, the association is strengthened. The constant occurrences of goal-oriented performance representation also make the trigger of corresponding mental representation become easy. Consequently, automaticity reflects the association of goal and behavior, and behavior indicates the instrumental role to accomplish the goal.

Aarts and Dijksterhuis (2000a) indicate that automaticity represents goal-directed behavior. And the activation depends on goals. Goals explain the activation of behaviors. They also empirically testify that automaticity triggers the occurrence of automatic behavior. Jacobs et al. (2011) also empirically clarify the impact of automatic and non-automatic motivators on attitude and perceived behavior control in the theory of planned behavior based on the self-determination perspective.

Smartphones are recent technology. Perceived masculinity of the technology then implies the social structure of gender and possibly motivates users' adoption of the technology through attitude, subjective norms, and perceived behavior control in the theory of planned behavior. In addition, as automatic motivator, it also possibly direct motivates users' intention to adopt smartphones. This study therefore intends to explore the partial mediating impact of users' perceived masculinity on their use intention of smartphones through attitude, subjective norms and perceived behavior control, and also the impact of users' perceived masculinity on their use intention. The hypotheses are proposed.

H5: Users' perceived masculinity of smartphones is significantly associated with their high-tech attitude toward using smartphones.

H6: Users' perceived masculinity of smartphones is significantly associated with their subjective norms.

H7: Users' perceived masculinity of smartphones is significantly associated with their perceived behavioral control.

H8: Users' perceived masculinity of smartphones is significantly associated with their use intention.

3. RESEARCH METHOD

To empirically clarify the impact of users' perception of masculinity of smartphones in their use or adoption of smartphones, this study adopted survey method. The construct measurements included: use intention, use of smartphones, high-tech attitude toward using smartphones, subjective norms, perceived behavioral control, and perceived masculinity of smartphones. All construct measures and operational definitions were based on existing instruments and literatures. All measurements were to be self-evaluated by the learners themselves, using a Likert seven-point scale ranging from (1) strongly disagree to (7) strongly agree. The final questionnaire was verified before formal survey. The respondents indicated the measures were well understood, and the questionnaire was then used for formal survey.

3.1 Data collection

To gather data from users of smartphones, an online questionnaire was built.

The questionnaire information was constantly posted on different forums or blogs in order to increase the number of respondents. And to attract valid respondents, online credit scores and drawing lots from valid respondents with gifts were both provided. However, the number of respondents was too limited. Therefore, this study turned to issue paper questionnaires by snowballing. Finally, in four months, one hundred and sixty-five valid questionnaires were gathered.

In filling the questionnaire, respondents were first asked if they used smartphones. And because some respondents indicated that they used more than one smartphone in pre-study, respondents were asked to answer the questions based on their most frequently used (or favorite) smartphones. Description of the respondents is shown in Table 1.

Table 1 The description of the respondents

Description	Frequency	Percent	Description	Frequency	Percent
Gender			Education		
Male	92	55.8%	High School	20	12.1%
Female	73	44.2%	Junior College	10	6.1%
Age			College/University	118	71.5%
Below 15	1	0.6%	Master	16	9.7%
16-20	34	20.6%	Doctor	1	0.6%
21-25	74	44.9%	Occupation Background		
26-30	19	11.5%	Student	88	53.3%
31-35	18	10.9%	Governmental and Military Service	10	6.1%
36-40	13	7.9%	Information Industry	12	7.3%
41-45	4	2.4%	Banking Industry	9	5.4%
46-50	2	1.2%	Manufacturing Industry	18	10.9%
Marriage			General Service	26	15.8%
In marriage	106	64.2%	Others	2	1.2%
Not in marriage	59	35.8%	Average Monthly Expense of Phones		
Daily Internet Use			NT\$1-600	67	40.6%
Less than an hour	11	6.7%	NT\$601-900	36	21.8%
1-3 hours	34	20.6%	NT\$901-1200	27	16.4%
3-5 hours	52	31.5%	NT\$1201-1600	19	11.5%
5-7 hours	31	18.8%	NT\$1601-2000	9	5.5%
Above 7 hours	37	22.4%	NT\$2001-3000	4	2.4%
Total	165	100%	Above NT\$ 3000	3	1.8%

Finally, about average use frequency of smartphones, the results were shown in Table 2. And about the operating systems of users' smartphones, the results were also shown in Table 2. The results indicated that the respondents used smartphones that had their operating systems for application installation. Thus, the respondents were valid and were used for data analysis.

Table 2. Average use frequency for smartphones and the operating systems

Average use frequency for smartphones	Frequency	Percent	Operating systems for smartphones	Frequency	Percent
1 Very infrequent	1	0.6%	Windows	5	3.0%
2	0	0.0%	iOS	37	22.4%
3	3	1.8%	Android	104	63.1%
4	30	18.2%	Symbian	3	1.8%
5	38	23.0%	BlackBerry	2	1.2%
6	47	28.5%	Palm	10	6.1%
7 Very frequent	46	27.9%	Others	4	2.4%

4. DATA ANALYSIS

A total of one hundred and sixty-five were valid respondents. PLS (partial least square) was then adopted for data analysis for it was less demanding in sample size.

PLS is an increasingly and commonly used data analysis method (Beatson et al., 2008; Drengner et al., 2008; Hsieh et al., 2008). It adopts the technique of bootstrapping for re-sampling and the partial least square method for coefficient estimation (Chin, 1998; Gefen et al., 2000).

To verify the hypotheses, this study adopted SmartPLS 2.0 for data analysis (Ringle et al., 2005). The measurement and structural models were both evaluated. Each construct was modeled to be reflective in data analysis.

4.1 Measurement validity

Construct convergent validity and discriminate validity were both provided to verify the construct measures (Komiak & Benbasat, 2006). The underlying factor structure was also justified.

4.1.1 Convergent validity

Convergent validity refers to the consistency that multiple items exhibit in measuring the same construct. Unidimensionality, average variance extracted (AVE), and composite reliability (CR) are adequate indicators of the convergent validity of measurements (Bagozzi & Yi, 1988; Steenkamp & van Trijp, 1991). Thus, they were included in this study. Concerning unidimensionality, the factor loading (>0.5) and t-value (>1.96) of items are both required. The results of factor loading, as well as AVE and CR, are provided in Table 3. The factor loadings of all items were higher than 0.5 and t-value higher than 1.96. Besides, all constructs had AVE values higher than 0.5 and CR values higher than 0.7. The results indicated commonly acceptable convergent validity of measurements (Fornell & Larcker, 1981; Chin, 1998; Hair et al., 2003).

Table 3 Average variance extracted (AVE), composite reliability (CR), and factor loading/weight of construct measurement

Constructs	AVE	CR	Cronbach's α	A	SN	PBC	PM	UI	AU	t-value
High-tech Attitude (A)										
A1				0.80						20.53
A2				0.85						27.92
A3	0.65	0.92	0.89	0.84						24.72
A4				0.82						23.06
A5				0.82						24.20
A6				0.72						12.28
Subjective Norms (SN)										
SN1					0.92					47.90
SN2	0.86	0.95	0.92		0.94					84.09
SN3					0.92					44.73
Perceived Behavioral Control (PBC)										
PBC1						0.80				19.48
PBC2	0.61	0.82	0.69			0.67				7.93
PBC3						0.86				28.28
Perceived Masculinity (PM)										
PM1							0.86			33.07
PM2							0.75			16.07
PM3	0.70	0.93	0.91				0.90			48.98
PM4							0.93			73.69
PM5							0.72			16.02
PM6							0.84			26.62
Use Intention (UI)										
UI1								0.94		81.23
UI2	0.81	0.94	0.92					0.92		62.39
UI3								0.86		31.20
UI4								0.87		33.86
Overall Average Use Frequency (AU)										
AU1	1.00	1.00	1.00						1.00	-

4.1.2 Discriminant validity

In the measurement of discriminant validity, the correlations between different constructs should be lower when compared with their own extracted variance explanations. The average variance extracted (AVE) and cross-loading can be adopted to assess discriminant validity (Kerlinger and Lee 2000). The root square of the AVE of a construct should be higher than its correlation coefficients with other constructs (Fornell & Larcker, 1981; Chin, 1998). In addition, the factor loadings belonging to the same construct should be higher than those of different constructs (Chin, 1998). The results are shown in Table 4. For all of the constructs, the square roots of the AVEs were higher than the correlation coefficients with other constructs. The results of factor loadings in Table 5 also indicated that each item loaded higher on its principal construct than on other constructs. Overall, the results suggested good measurement properties for all constructs.

Table 4 Construct correlations and square root of average variance extracted (AVE)

	A	SN	PBC	PM	UI	AU
A	0.81 ^a					
SN	0.49	0.93 ^a				
PBC	0.33	0.37	0.78 ^a			
PM	0.75	0.51	0.30	0.84 ^a		
UI	0.37	0.38	0.57	0.26	0.90 ^a	
AU	0.14	0.25	0.31	0.08	0.64	1.00 ^a

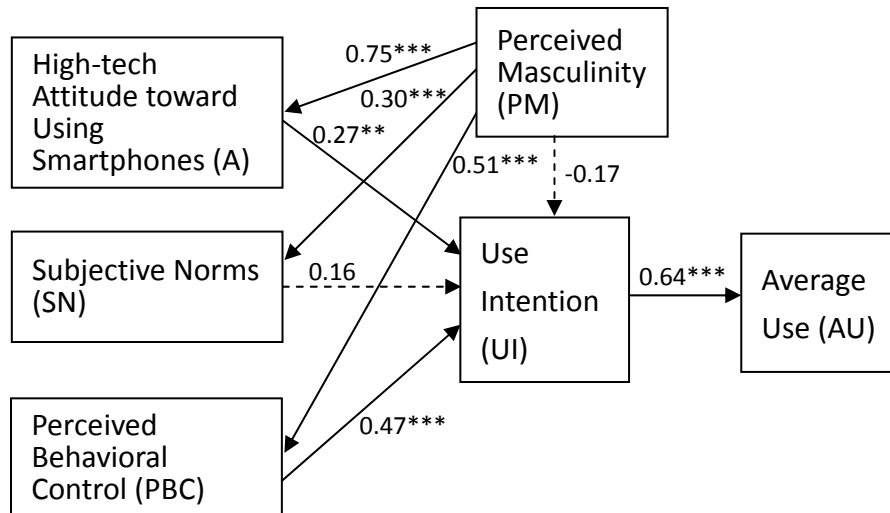
^a:It indicates the square root of average variance extracted (AVE) of the construct.

Table 5. Cross loadings

Items	A	SN	PBC	PM	UI	AU
A1	0.80	0.37	0.38	0.48	0.45	0.23
A2	0.85	0.30	0.32	0.55	0.33	0.13
A3	0.84	0.32	0.24	0.53	0.32	0.12
A4	0.82	0.45	0.20	0.73	0.25	0.03
A5	0.82	0.49	0.29	0.59	0.32	0.16
A6	0.72	0.42	0.20	0.72	0.17	0.05
SN1	0.46	0.92	0.36	0.44	0.40	0.26
SN2	0.45	0.94	0.35	0.50	0.37	0.24
SN3	0.44	0.92	0.32	0.49	0.28	0.18
PBC1	0.26	0.23	0.80	0.13	0.50	0.29
PBC2	0.16	0.20	0.67	0.24	0.23	0.00
PBC3	0.32	0.40	0.86	0.34	0.53	0.35
PM1	0.63	0.40	0.19	0.86	0.14	0.04
PM2	0.58	0.48	0.28	0.75	0.24	0.13
PM3	0.64	0.48	0.26	0.90	0.23	0.06
PM4	0.70	0.47	0.28	0.93	0.24	0.05
PM5	0.58	0.37	0.29	0.72	0.27	0.10
PM6	0.64	0.37	0.23	0.84	0.16	-0.01
UI1	0.37	0.36	0.59	0.19	0.94	0.65
UI2	0.39	0.30	0.50	0.22	0.92	0.61
UI3	0.36	0.37	0.44	0.29	0.86	0.51
UI4	0.22	0.35	0.51	0.24	0.87	0.51
AU	0.14	0.25	0.31	0.08	0.64	1.00

4.2 Path analysis

Given adequate convergent validity and discriminant validity, the study proceeded to empirically test the hypotheses. The SmartPLS analysis results are shown in Figure 1. The results indicated that all the hypotheses, excluding H3 and H8 (see below), were not rejected.



*: $|t| > 1.96$, $p < 0.05$; **: $|t| > 2.58$, $p < 0.01$; ***: $|t| > 3.29$, $p < 0.001$.

Fig. 1 The PLS results

5. DISSCUSSION, CONCLUSION, AND SUGGESTION

5.1 Discussion

5.1.1 Revalidate the relationship form attitude to behavior

The empirical results of this study indicated that users' high-tech attitude and perceived behavioral control had significant positive influence on their use intention of smartphones that significantly affected their actual use. Users' attitude valence of smartphones as high-tech and perceived control to acquire needed resources enhanced their intention to use the technology.

5.1.2 The impact of perceived masculinity of smartphones

The impact of perceived masculinity of smartphones was shown of significant positive impact on users' high-tech attitude, subjective norms, and perceived behavioral control. The results indicated users' perceived masculinity of smartphones enhanced their attitude valence toward using smartphones and also perceived control over using smartphone that further motivated use intention and actual use of smartphones. Masculinity implied the social structure of gender. The results of this study validated its importance in users' adoption of the technology of smartphones, and corresponded the the gender and technology perspective (Connell, 1995; Connell & Messerschmidt, 2005; Grint & Gill, 1995).

5.2 Conclusion and Limitation

With the development of mobile technology, more and more people are attracted to use smartphones. However, gender is an issue to cause impact on users' adoption of the new technology and may affect gender in different in further using of educational learning services or other important mobile service. This study clarifies the impact of perceived masculinity in users' use behavior based on TPB.

However, the link from users' perceived masculinity to their use behavior of smartphones cannot be established on the basis of a single empirical study. Hence, we need to be cautious when generalizing the findings. Further empirical studies gathering data from different culture background are recommended. In addition, important variables, such as normative influences, are not included in this study. Future research that takes into consideration these influences is suggested.

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國科會補助專家學者出席國際學術會議心得報告

日期：101年7月20日

補助編號	NSCNSC100-2629-H-214-001-		
計畫名稱	以計畫行為理論探討性別與行動科技產品陽剛特性對消費者使用意圖之影響---以智慧型手機為例(GM02)		
出國人員姓名	陳秀如	服務機構及職稱	義守大學
會議時間	101年7月11日至101年7月18日 (會議時間為101年7月13日至101年7月15日 學術參訪為101年7月12日、101年7月16日、101年7月17日、101年7月18日)	會議地點	中國武漢 Wuhan, China
會議名稱	(中文) IEEE管理與資訊工程國際會議 (英文) The International Conference on Management and Information Engineering (ICMAIE 2012)		
發表論文題目	(中文)以計畫行為理論探討智慧型手機使用者之陽剛態度對其持續使用意圖之影響 (英文)Exploring the impact of users' masculine attitude toward using smartphones on their continuous use intention – A study based on the theory of planned behavior		

一、參加會議經過

這次出席的 The International Conference on Management and Information Engineering (ICMAIE 2012)會議，主要由 IEEE 武漢分會、湖北第二師範學院、工

程資訊研究院等機構聯合舉辦，山東大學、武漢大學也參與協助此次會議舉辦。ICMAIE 致力於為管理科學、商業管理、電腦科學、資訊工程、電子商務與電子政務、經濟學、教育學等領域的專家與學者提供一個學術交流與建立友誼的平臺，使大家能夠分享優秀的論文和研究成果，共同探討所關注的問題。這次的會議議題涵蓋管理科學、商業管理、計算機科學、信息工程、電子商務與電子政務、經濟學、教育學等。由於這個會議由 IEEE 所舉辦，因此發表的文章不但收錄於研討會論文集與 IEEE Xplore 電子檢索中，另外也被 EI Compendex 與 Thomson ISI(ISTP) 所索引。

ICMAIE 2012 會議期間開始於 7 月 13 日(五)，結束於 7 月 15 日(日)，然而因華航班機僅週三週六有航班，其他航空公司也沒有機位只能排候補，因此僅能提早去，延遲回來，故此行並於這期間安排於當地學校參訪，由於華中科技大學與武漢大學在中國大陸皆約排行前 10 名內的大學，另外湖北第二師範學院因為為主辦這次研討會單位之一，能夠藉此機會加強學術間的交流，實在非常的有幫助。此行並十分感謝國科會能同意支付期間之生活日支費，才能與這些前段的大學院校建立初步的聯繫。

因此本人預訂從桃園至武漢的 7/11 去與 7/18 回的航班行程。第一天搭乘高鐵抵達桃園機場，再搭飛機從桃園機場到武漢，晚間抵達武漢後，雖因陌生地十分感到不安，但順利到達旅館入住。第二天上午到華中科技大學光電實驗室參觀。第三日主要行程是會議註冊報到，因此將要上台報告的投影片的重整以及重複演練英文的報告，加上十分擔心屆時有人問問題時無法清楚回答，故對於要上台報告的內容多次地重覆加以演練。第四日上午共聽取了二場 Keynote 演講，分別為來自澳洲墨爾本大學的 Zhang Rui 教授演講，其主題為 High-performance Management and Processing of Large-scale Moving Object Data，很年輕的學者，卻很有成就。



Keynote 演講--Zhang Rui 教授演講

第二場 Keynote 演講主講人為上海同濟大學的 Jia Jinyuan 教授，其演講主題為 Key Technologies on Developing Large Scale Web 3D Medias and Some Typical Applications on Mobile Internet。



Keynote 演講--Jia Jinyuan 教授演講

下午則聽取了一場 Keynote 演講，是日本德島大學(University of Tokushima)

的 Hiroaki Ogata 教授所講，因昨日適逢武漢多年來罕見的大雨，班機無法起降，因此將其演講時間延遲至下午，其演講主題為 Design and Practice on Technology-Enhanced Ubiquitous Learning Environments。



Keynote 演講--Hiroaki Ogata 教授演講

待演講結束後，下午則進行論文的報告，我報告結束後，法國 Emmanuel Monod 學者並引用其他學者的研究問了我一些問題，所幸都能順利回答，報告結束後我並與其討論，他也給了我一些研究方向上的建議，給我不同的啟發。



論文報告



與法國學者 Emmanuel Monod 討論問題並筆記記錄

晚上的晚宴，與當地武漢工業大學的老師以及河南來的一位老師有一些學術與教學經驗的交流。

第五天，大會安排至武漢博物館的參訪行程，在車上與廣西大學的老師進行一些交流，他也提到廣西大學已經是當地最好的學府，學費也相對較便宜，但有些優秀的同學，仍願意不辭千里至清華大學等學校就讀，這些學校不但遠，且學費也較昂貴，因此他們也想吸引更多優秀的同學加入他們當地的學術學習。另外也遇到一位老師他說他的書不但在香港有發行，在台灣也有發行。與這些老師交流的過程，發現這些老師都很謙和，但都很優秀，實在令人敬佩。下午則至辛亥革命紀念館參觀，見證辛亥革命的起源地。第六天則至武漢大學不同校區參觀，第七天則至華中科技大學的其他校區參觀，第八天則到湖北第二師範學院交流，主要拜訪他們計算機學院，下午則收拾行李，順利回來。

二、與會心得

大會共邀請三場 Keynote 演講，每位講者講完後我都與他們討論問題，進行交流，中午用餐時，也跟 Zhang Rui 教授和 Jia Jinyuan 教授一起用餐。Zhang Rui 教授很年輕，但很有成就，因此跟他請教了他如何在學術上發展自己的能力，也請教了他在學術投稿上的不同經驗。



與 Keynote 演講者 Zhang Rui 教授合影

Jia Jinyuan 教授在演講時，展示了他們的研究成果，如何透過 3D 資訊的輕量化，使其在網路上傳輸更為有效率，且不失 3D 的逼真程度，是非常實用且有研發價值的技術，他並展示如何將其技術應用在博物館的網路展覽上、網路上實體車子的展示上，也提到將應用在 3D 遊戲上，他所展示的作品精細而不失真，但所耗費的記憶體卻很小，相信很有機會成為業界的主流，他也提到 ADOBE 廠商也有在跟他洽談 FLASH 的繪圖引擎重新建構，若其技術將來運用在該軟體的繪圖引擎上，相信又會帶來不同的發展。



與 Keynote 演講者 Jia Jinyuan 教授合影

另外Hiroaki Ogata教授則建構了在智慧型手機平台下可使用的語言e-learning系統，透過與使用者環境記憶的聯結，將其學習的字彙建置在該系統中，如此不但可加深學習者的記憶，也有助於其彈性地於不受空間限制的學習。我並且跟他要了資料，希望能試試使用他們的系統，他也很樂意將資料給我，屆時安裝於手機後可以跟他聯繫登錄的帳號密碼等問題。



與 Keynote 演講者 Hiroaki Ogata 教授合影

能參加這次會議，與 Keynote speakers 的交流，給我有不同的啟發意義，雖然仍在黑暗中摸索學習，但能了解他們不同的發展，對我是很好的啟發。尤其第二位講者發展的方式與思考的方向，雖然與我的領域不同，但他動態地表達他們發展的歷程，對我是很好的啟發。

三、考察參觀活動(7/12、7/16、7/17、7/18)

抵達武漢後第二天(7/12)上午到華中科技大學光電實驗室參觀，因剛好有其他本地學校的人員參觀，因此就一同聽其簡報，由於該實驗室著重於光電之發展，因此注重光與電的發展，除了延攬許多國外學者，這些學者也有些是 IEEE fellows 與光學方面的 fellows，並有文章發表在 Science 與 Nature，在學術上的發展實在是十分傑出，這也難怪華中科技大學在學術上有其舉足輕重的地位。



武漢光電實驗室展示廳



武漢光電實驗室介紹區

下午則到武漢大學參觀，雖是放暑假期間，但樓下腳踏車不少，在研究室的老師也幾乎座無虛席，其努力上進的態度，值得令人予以肯定；也有榮幸遇到其學校老師撥冗會見，該老師於國際上學術有卓越表現，令人感到十分敬佩。

抵達武漢後第六天(7/16)則至武漢大學不同校區參觀，上午到他們有圖書館的主校區參觀，他們的圖書館很新很大也很寬敞，座位上也是座無虛席。下午則到他們計算機學院參觀，他們的研究生暑假也都在學校努力認真，老師待人也很有和善。

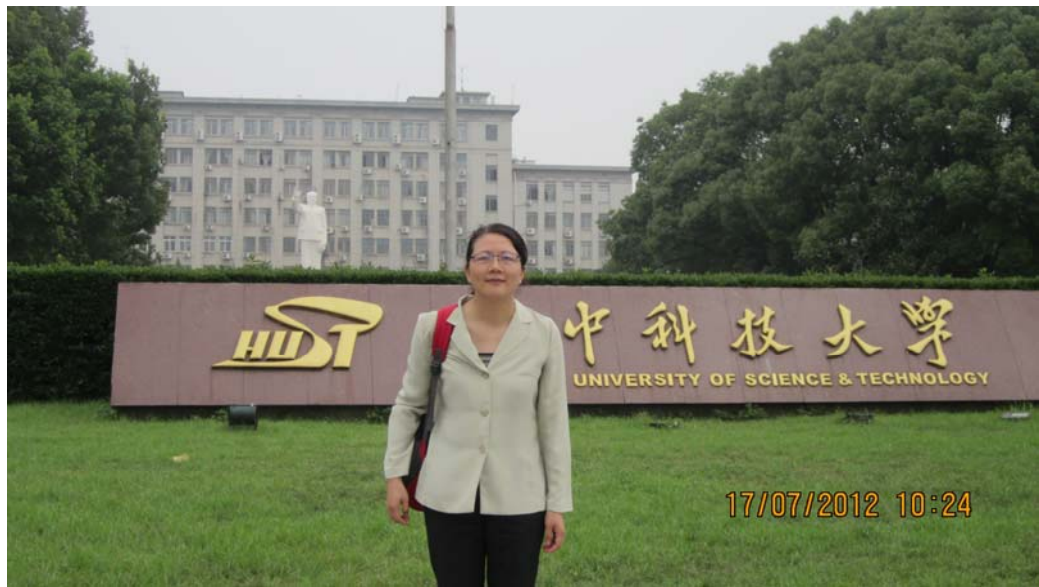


武漢大學正門門口



武漢大學圖書館

第七天(7/17)則至華中科技大學的其他校區參觀，不過該校主校區的圖書館稍較老舊，也不開放參觀，可以看得出雖然武漢大學與華中科技大學都是很頂尖的學校，校區也都非常非常大，但發展上也仍是個自有各自的發展；下午則至信息學院參訪，學生很熱心也很善良，老師人很客氣，也聊到了不同時期老師的發展也不同，老師也聊到他到雪梨交流的經驗，是很好的國際學術交流經驗。



華中科技大學正門門口



華中科技大學軟件學院



華科技大學網路實驗室

第八天(7/18)則到湖北第二師範學院交流，主要拜訪他們計算機學院，由於他們是這次研討會的主辦單位之一，因此希望透過這個機會建立學術交流與聯繫，他們新校區大且寬敞，老師人都很好也很和善，除了感謝他們在研討會的幫助外，也聊到了學生畢業後的就業，以及企業發展與學術人力的發展。下午則收拾行李，順利回來。



湖北第二師範學院計算機學院

四、建議

此次研討會邀請的講者所主講的主題都非常的有實用性與研發性，給我很好的啟發。另外所參訪的學校，都是頂尖大學，雖然其發展重點不同，但都不約而同地發展成為綜合大學，相信發展潛力很高。

另外，武漢當地正在興建捷運，計畫從長江地下貫穿而過，而且可直達機場，相信對以後至武漢開會或出差，可以有很大的便利，也可降低因當地氣候問題帶來的影響。

五、攜回資料名稱及內容

攜回的主要資料包括會議論文集、論文集光碟(CD)、大會手冊與湖北省第二師範學院簡介、湖北省第二師範學院計算機學院簡介。

六、其他

國科會補助計畫衍生研發成果推廣資料表

日期:2012/07/23

國科會補助計畫	計畫名稱: 以計劃行為理論探討性別與行動科技產品陽剛特性對消費者使用意圖之影響---以智慧型手機為例(GM02)
	計畫主持人: 陳秀如
	計畫編號: 100-2629-H-214-001- 學門領域: 資訊管理
無研發成果推廣資料	

100 年度專題研究計畫研究成果彙整表

計畫主持人：陳秀如		計畫編號：100-2629-H-214-001-					
計畫名稱：以計劃行為理論探討性別與行動科技產品陽剛特性對消費者使用意圖之影響---以智慧型手機為例(GM02)							
成果項目		量化			單位	備註（質化說明：如數個計畫共同成果、成果列為該期刊之封面故事...等）	
		實際已達成數（被接受或已發表）	預期總達成數(含實際已達成數)	本計畫實際貢獻百分比			
國內	論文著作	期刊論文	0	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	0	0	100%		
		專書	0	0	100%		
	專利	申請中件數	0	0	100%	件	
		已獲得件數	0	0	100%		
	技術移轉	件數	0	0	100%	件	
		權利金	0	0	100%	千元	
	參與計畫人力 (本國籍)	碩士生	2	0	100%	人次	學生透過計畫的參與，了解研究流程的進行，獲得研究進行的經驗，有助增加其科學邏輯思考，並將該經驗推展於其工作方面更深度的發展與抽象思考能力，也有助其對未來獨立於學術研究之發展。
		博士生	0	0	100%		
		博士後研究員	0	0	100%		
		專任助理	0	0	100%		
	國外	論文著作	期刊論文	0	1	100%	篇

						會脈絡對於消費者科技採用影響之不同觀點。
		研究報告/技術報告	0	0	100%	
		研討會論文	1	0	100%	本研究於 IEEE 研討會進行發表，並於研討會進行期間，至武漢大學與華中科技大學等學校進行學術參訪，有助於學術之交流。
		專書	0	0	100%	章/本
專利	申請中件數	0	0	100%	件	
	已獲得件數	0	0	100%		
技術移轉	件數	0	0	100%	件	
	權利金	0	0	100%	千元	
參與計畫人力 (外國籍)	碩士生	0	0	100%	人次	
	博士生	0	0	100%		
	博士後研究員	0	0	100%		
	專任助理	0	0	100%		

其他成果
(無法以量化表達之成果如辦理學術活動、獲得獎項、重要國際合作、研究成果國際影響力及其他協助產業技術發展之具體效益事項等，請以文字敘述填列。)

本研究部分結果發表於 IEEE 研討會，研討會期間與許多學者有所互動，包括一法國資深學者，另並於研討會進行期間，至武漢大學與華中科技大學等學校進行學術參訪，有助於學術之交流，與未來可能學術合作之發展。另本研究結果提供科技與性別意義關係之不同思考，其實證結果除了有助於了解智慧型手機科技與性別意義之關係外，也有助於瞭解因科技造成可能數位落差與社會發展之影響。

	成果項目	量化	名稱或內容性質簡述
科教處計畫加填項目	測驗工具(含質性與量性)	0	
	課程/模組	0	
	電腦及網路系統或工具	0	
	教材	0	
	舉辦之活動/競賽	0	
	研討會/工作坊	0	
	電子報、網站	0	
	計畫成果推廣之參與(閱聽)人數	0	

國科會補助專題研究計畫成果報告自評表

請就研究內容與原計畫相符程度、達成預期目標情況、研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）、是否適合在學術期刊發表或申請專利、主要發現或其他有關價值等，作一綜合評估。

1. 請就研究內容與原計畫相符程度、達成預期目標情況作一綜合評估

達成目標

未達成目標（請說明，以 100 字為限）

實驗失敗

因故實驗中斷

其他原因

說明：

2. 研究成果在學術期刊發表或申請專利等情形：

論文： 已發表 未發表之文稿 撰寫中 無

專利： 已獲得 申請中 無

技轉： 已技轉 洽談中 無

其他：（以 100 字為限）

另已發表文章於 IEEE 研討會（ICMAIE 2012）

3. 請依學術成就、技術創新、社會影響等方面，評估研究成果之學術或應用價值（簡要敘述成果所代表之意義、價值、影響或進一步發展之可能性）（以 500 字為限）

The ratio of the number of gathered data to the largest path model in this study was about twenty, much better than the standard of five to ten for data analysis in PLS. The results of the study also validated the significant impact of perceived masculinity in users' use of smartphones; this reflected the importance of gender in users' adoption of the technology. The results facilitated the marketing of smartphones suppliers. The results were also planned to be submitted to indexed international journals.