

行政院國家科學委員會補助專題研究計畫成果報告 期末報告

以使用者導向建構差異化 3D 體型健康管理服務平台 研究成果報告(精簡版)

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計畫主持人：陳碧慧

計畫參與人員：博士班研究生-兼任助理人員：王明旭

處理方式：

1. 公開資訊：本計畫涉及專利或其他智慧財產權，研究成果報告(精簡版)2年後可公開查詢
2. 「本研究」是否已有嚴重損及公共利益之發現：否
3. 「本報告」是否建議提供政府單位施政參考：否

中華民國 103 年 01 月 25 日

中文摘要：近年來健康和美體產業快速發展，因生活型態與需求改變衍生創新管理產學議題。身體意象是一個創新的概念，關於人體理解與建構，涉及身體形狀、態度和思維等，對健康和美體產業有顯著的影響。人們生活中經常自我檢查身體的變化，體型是連結人體健康的重要指標；過去有許多研究體型健康的文獻，普遍使用身體質量比、腹圍、腹臀比，用於判斷健康的指標，另有研究證實腹身高比與第二型糖尿病相關，腹腿比與代謝症候群相關。

針對上述議題，本研究分兩部分進行，第一部分為針對體型健康差異進行分類建構，使用身體質量比、腹圍、腹臀比、腹身高比與腹腿比等五項體型健康指標。在基隆長庚紀念醫院健康促進中心採用 3D 全身立體攝影系統，從 95 位受檢者中找出男性與女性每一分級的體型特徵，給予受檢者比較自己體型後，檢視五項健康指標統計量，並用以區辨四級的體型健康；讓受檢者從分級資訊預知，及早健康促進預防心血管疾病、糖尿病等。

第二部分研究進行身體意象的概念探討，找出計畫行為理論 (TPB) 的路徑與顯著影響因子。調查時間為期兩個月，共收集台灣北部 460 受試者，來自 11 個不同的職業單位。採用結構方程 (SEM) 建模方法，其結果支持該模型；發現自我認同和環境氛圍可能會影響對身體意象的態度，主觀規範、知覺行為控制 (PBC)、態度和身體意象不滿意度 (BID) 可能影響身體意象的關注與概念。研究發現，個人體型外在與概念的差異確實存在，而不同族群重視的體型目標也有所不同，建議健康促進等相關服務可以依據不同族群需求與特質，提出體型健康差異化服務與創新管理應用。

中文關鍵詞：創新管理、身體質量比、腹圍、腹臀比、3D 全身立體攝影系統、身體意象

英文摘要：Health and beauty care industries could be the innovative management issues in the future base on their fast development, needs and change. Body image is difficult to understand for its uncertain concept. And body image is an innovative concept for human body. Body image is a concept that relate to our body shape, mind and thinking. The concept of body image will affect the health care and body beauty industries deeply in the future. People always check the body change in our daily life for the healthy and

beauty reasons.

Systemic use of 3D stereoscopic camera system will be measured in circumference, according to health inspection grading concept, five integrated health indicator data, divided into four hierarchical healthy body, and its five standard values some exceptions, the future may lead to cardiovascular disease, diabetes and so on. Is designed to allow the subjects from the Attorney grading can be detected early to predict, early prevention opportunities. From Keelung Chang Gung Memorial Hospital Health Promotion Center, 95 subjects in the male and female body characteristics to identify each classification, given subjects compare themselves body, the view of the five health indicators, health indicators and five standard values gaps need to change their own body to remind ourselves , that is the new trend in medicine is prevention.

Body change is very significant to check by vision and measurement. But we always did not know what factors affect the body images for people in different status. This study explored the concept of the body image of Taiwanese and investigates theory of planned behavior (TPB) for the factors that affect the body image. This survey-based study, conducted with 460 participants, from 11 different vocations and mainly collecting at north part of Taiwan completed the survey in two months. This study adopts structural equation modeling methodology, and the result supports the proposed model. Furthermore, we find that self-identity and climate could affect the attitude for body image, and the subjective norm, perceived behavioral control (PBC), attitude and body image dissatisfaction (BID) could affect the intention for the body image attention. We conclude with a consideration of contributions of the study' s findings. And the conceptual model form this study will try to provide health care industry and beauty industry related innovation management concepts.

英文關鍵詞： Innovation management, body mass index, waist circumference, waist-hip ratio, 3D stereo camera system body, body image

行政院國家科學委員會補助產學合作研究計畫成果完整報告

以使用者導向建構差異化 3D 體型健康管理服務平台

To direct user-oriented concept to construct differentiated 3D anthropometric health management services platform

計畫類別： 先導型 開發型 技術及知識應用型

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共同主持人：

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中文摘要及關鍵詞(keywords)

身體意象是一個創新的概念，關於人體理解與建構，涉及身體形狀、態度和思維等，對健康和美體產業有顯著的影響。人們生活中經常自我檢查身體的變化，體型是連結人體健康的重要指標。

針對上述議題，本研究分兩部分進行，第一部分為針對體型健康差異進行分類建構，使用身體質量比、腹圍、腹臀比、腹身高比與腹腿比等五項體型健康指標。在基隆長庚紀念醫院健康促進中心採用3D全身立體攝影系統，從95位受檢者中找出男性與女性每一分級的體型特徵，給予受檢者比較自己體型後，檢視五項健康指標統計量，並用以區辨四級的體型健康；讓受檢者從分級資訊預知，及早健康促進預防心血管疾病、糖尿病等。

第二部分研究進行身體意象的概念探討，找出計畫行為理論（TPB）的路徑與顯著影響因子。調查時間為期兩個月，共收集台灣北部460受試者，來自11個不同的職業單位。採用結構方程(SEM)建模方法，其結果支持該模型；發現自我認同和環境氛圍可能會影響對身體意象的態度，主觀規範、知覺行為控制（PBC）、態度和身體意象不滿意度（BID）可能影響身體意象的關注與概念。。

關鍵字：創新管理、身體質量比、腹圍、腹臀比、3D全身立體攝影系統、身體意象

Abstract

Health and beauty care industries could be the innovative management issues in the future base on their fast development, needs and change. Body image is difficult to understand for its uncertain concept. And body image is an innovative concept for human body. Body image is a concept that relate to our body shape, mind and thinking. The concept of body image will affect the health care and body beauty industries deeply in the future. People always check the body change in our daily life for the healthy and beauty reasons. Body change is very significant to check by vision and measurement. But we always did not know what factors affect the body images for people in different status. This study explored the concept of the body image of Taiwanese and investigates theory of planned behavior (TPB) for the factors that affect the body image. This survey-based study, conducted with 460 participants, from 11 different vocations and mainly collecting at north part of Taiwan completed the survey in two months. This study adopts structural equation modeling methodology, and the result supports the proposed model. Furthermore, we find that self-identity and climate could affect the attitude for body image, and the subjective norm, perceived behavioral control (PBC), attitude and body image dissatisfaction (BID) could affect the intention for the body image attention. We conclude with a consideration of contributions of the study's findings. And the conceptual model form this study will try to provide health care industry and beauty industry related innovation management concepts.

Keywords: Innovation management, body mass index, waist circumference, waist-hip ratio, 3D stereo camera system body, body image

Part1.User-oriented workshop and body image category

1.1 Body image collection and analysis

- (1) First, the subjects brought to Keelung Chang Gung Memorial Hospital, 5th Floor, Room 3D photographic inspection zone, put his hands to the subjects on crutches on both sides of the main camera angle adjustment
- (2) Check the clothes given to subjects, and please put the subject back to the locker room, then please return to the subject area of photography on location photography shoot
- (3) Finally, the subjects required in accordance with instructions from shoot to shoot 3D images, taken to the locker room after the original clothing exchange is complete.

After closing the case after the completion of shooting 3D images retouching, retouching using Beauty 3D analysis software to other miscellaneous map does not belong to the subject's body image is deleted after the analysis, database analysis using human Chang Gung Memorial website background management system after retouching finished 3D image upload, and then follow the one-dimensional, two-dimensional, three-dimensional to calculate the size of the data subject's body, which will be abdominal circumference, hip circumference, right thigh circumference calculated five health indicators and other measuring 28 data, which placed inside the 3D inspection reports contain data BMI, abdominal circumference, abdominal hip ratio, abdominal thigh ratio, abdominal height ratio.

1.2 Body healthy category for four levels

In accordance with the national health examination, do distinguish four levels. By the classification, according to several anomalies that do differentiate, you may get a related disease, to give advice; the main purpose is to remind the body of the subject's body is what the current state.

- (1) Level 1, the grading of five health indicators all normal.
- (2) Level 2, the grading of five health indicators, there are one or two exceptions.
- (3) Level 3, the grading of five health indicators, there are three to four exceptions.
- (4) Level 4, the grading of five health indicators all exceptions.

1.3 Results

We will charge to organize the information into a checking case reports, as one of the top personal inspection reports 3D image front, right side, back, inside the data contained BMI, abdominal circumference, abdominal hip ratio, abdominal thigh ratio, abdominal height ratio, five health indicators, and inspection reports in a week, and health promotion center health check report, together with giving subjects, 3D stereoscopic inspection report companion CD acetate film, the contents of the subjects own 3D stereo images, 3D shape plugin Anthro 3D, as shown in two main subjects is to make the proposed operation can also measure your body.

All data will be divided into male and female and first grade to fourth grade, and calculates the sum of the difference between the value of each minimum and representatives of each grading size. Women first grade difference value is 3.07, second grade difference value is 4.53, third grade values of 5.48, fourth grade difference value is 15.74. Men first grade difference value is 2.02, second grade difference value is 2.48, third grade difference value is 4.43, and fourth grade difference value is 6.17. Each grade

will be selected out of the body healthy subjects, representing the classification of images,

Part 2. Body image concept survey

2.1. Introduction

With many people put more emphasis on health and appearance beauty, the development in medical beauty industry is thriving and prosperous. According to the survey from BBC (British Broadcasting Corporation) reveal that output value of aesthetic medicine in 2008 reach USD 23 billion, and predict it with the growth to USD 43 billion. However, this phenomenon appears that individuals care about their physical appearance increasingly, especially weight and shape. Many previous researches pointed out conceptions and evaluations of body image are evident across the life span for males and females and are core aspects of the representation of self for children, adolescents, and adults (Harter, 1990; Tiggemann, 2004). In addition, Furnham et al. (2002) argued that BID in different gender might affect individuals' eating attitude, self-esteem, and willing of exercise. As the core of this research is body image dissatisfaction (BID), we not only explored the relationship between BID and behavioral intention toward body image controlled activities, but also investigate other factors may make individuals form inclination to proceed with the actions of satisfying their extrinsic or intrinsic demands via theory of planned behavior (TPB). BID plays an important role in causing individuals to engage in their body change behaviors, including eating habit, exercise, and drug use to reach the goals they want. (Furnham et al., 2002; Xu et al., 2010). Many research have explored the cause of BID and make many people, especially for adolescents and adult women, emphasize more on their appearance and alter eating or exercise habits further (Blashill, 2011; Matz et al., 2002; McCabe & Ricciardelli, 2004).

In our research, we expect to achieve some specific objectives. First, prior research has primarily focused on the correlation between BID and weight loss (Matz et al., 2002) and largely ignored the latent induced factors that stimulate individuals to adopt actions to improve their body shape. Furthermore, little is known about the social influence on impact effectiveness of proceeding body shape control, defined as subjective norms (e.g. the expectation or opinion of relatives or friends). That is when individuals decide to adopt certain behavior, others' words or attitude sometimes may have a prominent position to enhance or change their mind (Bagozzi & Dholakia, 2002). On the other side, taking actions of body shape control apart from influence by other people, individuals also need possess ability, which including external environment conditions and internal self-competence. Before adopting behavior, people may evaluate themselves to have ability or beliefs that possess the skill and resources necessary to succeed during the process (Elliott et al., 2003). Hence, we expect to extent prior research to use TPB model to deeply explore the antecedents of intention of adopting body shape control behaviors. Secondly, we also propose body image which affects people's psychology motivation (e.g. self-esteem) is one of the most important factors to make influence on their willing to proceeding body shape control. In addition, we find that attitude could be usually affected by one's self-identity and environment climate, result in deciding to adopt certain behavior. In our research, we explore the antecedents of attitude and further categorize into internal factor- self-identity, and external factor- climate.

This study is designed to contribute to body image management by: First, developing the modification TPB model to understand the behavior intention of body shape control; second, enhancing understanding of the role that BID in the process of

behavior intention formation; third, dealing with the conscientious examination of the impact of self-identity and climate on individual's attitude to affect toward body image.

2.2. Theoretical background and hypothesis

2.2.1 Theory of planned behavior and related theory

TPB was developed by Ajzen (1991) that extend the theory of reasoned action (TRA) (Fishbein & Ajzen, 1975) adding the concept of perceived behavioural control (PBC) to fully interpret the behaviors under specific context. TRA which is based on social psychology point out that individuals' behaviors may be influenced by the degree of intention. And individuals' attitude and subjective norms toward behaviors could lead to the different degree of intention. In other words, TRA assume that an individual can decide on taking action by himself after collecting related information and considering carefully. Nevertheless, Shepperd et al. (1988) argued that individual's behavior sometimes is not under complete volitional control. For example, before making a decision to execute an action, an individual may consider many latent factors, such as resource, time, ability, and past experience etc. That is, PBC can provide more information about non-volitional factors and increase potential limitations for individuals' intention to predict behavior (Elliott et al., 2003).

According to TRA, individuals' behaviors can be predicted by intention, and except for PBC, attitude and subjective norm must influence on behaviors via intention. Additionally, prior researches also find other variables might influence behavior directly, including knowledge and skills, past habit, and environment limits etc. (Montaño & Kasprzyk, 2008). Prior researchers have used TRA in exploring the formational process of many behaviors and explaining the behaviors with high R^2 (Elliott et al., 2003). More importantly, several meta-analyses have shown that behavioral intention is predictable from the three components of the TPB. (Godin & Kok, 1996; Sheeran & Taylor, 1999). Previous researches, TPB has been adopted in many various contexts to explore deeply the causes of human behaviors and intention and be a basic behavior-adopted principle (Conner et al., 2002; Elliott et al., 2003; Hrubes et al., 2001; Pavlou & Fygenson, 2006).

2.2.2 Research framework and hypothesis

Subjective norm

Subjective norm is an influenced factor of social aspect. It posits that while an individual makes a decision, he must consider many factors from various dimensions and be influenced by others' expectation to form norm pressure (Ajzen, 1991; Kelman, 1974). In other words, an individual may emphasize on opinions or expectations from the people who are thought dependable and important; Fishben & Ajzen (1975) argued that subjective norm is anticipated pressure which an individual might face before action. Subjective norm can make an influence on the degree of intention of an individual. Specifically, if an individual perceive higher support toward proceeding weight or body type control from the people thought important, the one's intention to act may be higher; whereas, once an individual does not obtain support from important people, the one's will to act is low. The above discussion leads to our first hypothesis:

Hypothesis 1: Subjective norm has a positive impact on intention of weight control or body type adjustment by sports, diet, or medicine.

Perceived behavioral control

PBC (perceived behavioural control) is defined as an individual's perception of the degree how he can control over and carry out a behavior (Ajzen, 1991; 2002); that is the belief of the degree of ease to realize behaviors-adopted. The construct can be divided into internal and external concepts: internal concept is an ability of individuals to execute or control the progress of tasks. Past researches argued this concept is a kind of self-efficacy (Elliott et al., 2003; Pavlou & Fygenson, 2006). The other concept is attributed as an external factor, external resources, which is sufficient for individuals to adopt behavior, including, time, money, interpersonal relationship or related outside resources. Briefly, the concept is depended on ability, resource, and opportunity. Thus, we propose the following hypothesis:

Hypothesis 2: Attitude has a positive impact on intention of weight control or body type adjustment by sports, diet, or medicine.

Attitude

Except for subjective norm, intention is also influenced by intention. Fishbein & Ajzen (1975) depicted that the formation process of attitude is via thinking and reasoning by a decision-maker. Actually, some scholars argued the formation of attitude is an evaluated process for whole event to transform into psychological tendency toward specific behaviors (Eagly & Chaiken, 1993) (i.e. the degree of like or dislike). The psychological tendency can be learned by past experience and repeat contacts to strengthen and become a reaction tendency to specific events or operations (Campbell, 1963). Hence, if the context happened again, decision-makers may act their evaluation procedure in their mind automatically and then associate with the events or behaviors in thinking to affect behavioral intention finally (Eagly & Chaiken, 1993). Thus, we propose the following hypothesis:

Hypothesis 3: Attitude has a positive impact on intention of weight control or body type adjustment by sports, diet, or medicine.

Body image dissatisfaction

Satisfaction is defined as an extent of which positive attitude of the customer's content with whole transaction process and is considered as a judgment that a service brings customers pleased fulfillment (Lam et al. 2004; Oliver 1980, 1996). That is to say dissatisfaction can be caused by the degree of discrepancy between anticipation and real service or product performance (Anderson 1973). Hence, dissatisfaction which is a negative evaluation can be accumulated by past discontented experience leading to negative feelings and attitude easily to affect franchisees' behaviors in franchising. disparagement (Friedman & Brownell, 1995), and is more common among obese than nonobese persons and is higher in obese women than in obese men (Cash et al., 1986; Sarwer et al., 1998). For example, male who is very thin often expect to add weight to have a stronger and more vigorous figure; whereas obese male expect to reduce weight to get better outside looking.

Hypothesis 4: Body image dissatisfaction has a positive impact on intention of weight control or body type adjustment by sports, diet, or medicine.

Self-identity

Self-identity refers to salient and enduring aspects of one's self-perception (Sparks, 2000), e.g., "I think of myself as a 'health keeper'". According to identity theory (Thoits & Virshup, 1997), people apply socially meaningful categories to describe themselves when answering the question "Who am I?" in terms of, for example, socio-demographic characteristics (e.g., gender), social roles (e.g., mother, father), social types (e.g., smoker, exerciser, healthy eater, blood donor), and even personality traits (e.g., honest, optimist). Thus, self-identities (or "me" identifications) are the perspective one takes toward oneself when taking the role of specific or generalized others, implying that one incorporates the meanings and expectations associated with a relevant categorization into the self, thus forming a set of identity standards that guide identity-relevant behaviors (Stets & Burke, 2000; Rise et al., 2010).

Fishbein & Ajzen (1975) would consider that self-identity should be reflected in beliefs and values. Following this line of thinking, self-identity should be considered an antecedent of attitudinal evaluations, and the inclusion of self-identity would thus represent neither a theoretical nor an empirical advance (Sparks & Guthrie, 1998). When a person's self-identity is important to him/her, then the creation, affirmation, and subsequent expression of self-identity will entail an evaluation of the potential behavioral outcome of expressing this self-identity (Thorbjørnsen et al., 2007). According to TRA, such an evaluation of behavioral outcomes will influence attitudes (Sparks & Shepherd 1992). Consequently, self-identity is conceptually distinct from evaluative attitudes, and, moreover, there exists a causal link between self-identity expressiveness and attitudes (Thorbjørnsen et al., 2007). Hence, the effect of self-identity on intention to use is (partially) mediated by attitudes. In other words, people who think themselves emphasizing their body images and understanding what advantages from good body images will be get may have positive attitude toward the activities of body image control. The above discussion leads to our hypothesis:

Hypothesis 5: Self-Identity has a positive impact on intention of weight control or body type adjustment by sports, diet, or medicine.

Climate

Climate is defined as the extent of which an individual perceive what procedures, practice, events, and related behaviors or thoughts are supported, incentive, encouraged and expected by entire organization or surrounding in life (Schneider, 1983). In the context of working environment, Wilson et al. (2004) also selected some dimensions to shaping organizational climate including organizational support, coworker support, participation and involvement, and health and safety atmosphere. In other words, climate is an important extrinsic factor of social context in organizations and can be manipulated by people with power and influence directly or indirectly (Bock et al. 2005). In our research context, people who get along with us in daily life share some healthy information and experience or unconsciously and cultivate health consciousness gradually; additionally, organizations often instill some health concepts and offer health-improved information for members may also affect their psychological evaluation (Basen-Enquist et al., 1998).

Previous research argued that environmental factors may be influenced health behaviors while processing worksite health promotion (Basen-Enquist et al., 1998). Wilson et al. (2004) also found that employees' psychological tendency adjustment could be affected by variation of organizational climate to change their extrinsic behaviors. Similarly, positive climate in organization may make incentive to drive functioning and

productivity via making an impact on members' attitude (Aarons & Sawitzky, 2006). Specially, climate also could form a few members identification and make them display related behaviors unconsciously, even though use verbal persuasion to influence other members' attitude (Bock et al., 2005). Hence, the essence of climate is to change and influence members' attitude and behaviors unobtrusively and imperceptibly. In our research context, people may be affected by others habits, words, emotion, and health promotion and activities of organizations to change or confirm their attitude toward the activity of body image control. On the basis of the above arguments and evidence, we propose the following hypothesis:

Hypothesis 6: Climate has a positive impact on attitude of individual behavior intention for weight control or body type adjustment by sports, diet, or medicine.

2.3. Methods

2.3.1 Process of data-collection

Data were collected through questionnaire survey by research assistants enlist respondents of different companies in various industries, college students, retired people etc. to fill questionnaire, which conducted over three months (from May to August 2013). As soon as completed it, we gave them food or beverage coupon which is worth NTD 50 to lift answer quality. For the sake of some embarrassing questions, we adopted anonymous questionnaire and prepared sealed envelopes to make respondents feel comfortable and safety to increase response will and reflect their true opinions.

2.3.2 Sample characteristic

A total of 460 participants, from 11 different vocations and mainly collecting at north part of Taiwan completed the survey. Of the entire sample, 38.48% were male, 61.52% were female. Respondents ranged in age spread from below 24 to above 65 years old; the most part of respondents is between from 24 to 36 (43.26%), 36 to 48 is accounted for 26.09%, and 48 to 60 is accounted for 12.39%. Over one-seconds (55.22%, 254) were university graduated, while 92 (20.00%) were graduate school or above, 61 (13.26%) held senior high (vocational) school or below, and 53 (11.52%) were College (2 years). In respondents' monthly income distribution, over one-thirds (33.04%, 152) were from 30,001 to 45,000 (NTD), 99 (21.52%) were below 15,000, and 89 (19.35%) are from 45,001 to 60,000; on the other hand, monthly expense distribution of sample held the most large part (38.04%, 175) is below 15,000, and secondly is between 15,001 and 30,000 (34.13%, 154).

2.3.3 Measures

Questionnaires employed the same Likert 7- and 5-point scales used in the original (English-language) scales. These original scales were translated into traditional Chinese and then back-translated to ensure conformance of all translated items to their English-language counterparts. (Brislin, 1980).

Behavioral intention. In order to evaluate precisely in degree of behavioral intention, we assess this construct with the scale of Fishbein & Ajzen (1975). Respondents were asked to respond to each item based on (from 1, "strongly disagree," to 7, "strongly agree"). Sample items include: "Within a month, I will do my best to participate in body image controlled activities to attain my ideal body image"; "Within a month, I will encourage my relatives and acquaintances to participate in body image controlled activities to attain

their ideal body image”; “If there are some body image controlled activities, I will intent to join these to attain my ideal body image”. Analysis results indicated the items had a construct composite reliability (CR) of 0.81 and average variance extracted (AVE) of 0.59.

Subjective norm. The items measuring subjective norm are adapted from Fishbein & Ajzen’s (1975) research. Respondents indicated the degree (from 1, “strongly disagree,” to 7, “strongly agree”) to which respondents may be affected by surrounding people to participating in body image controlled activities using items such as, “My relatives and acquaintances agree very well with me to participate in body image controlled activities” and “My relatives and acquaintances think it should be encouraged for participating in body image controlled activities.” Analysis results indicate this scale has a CR of 0.88 and AVE of 0.79.

Perceived behavioral control. The measure of perceived behavioral control is almost identical to the measure applied by Bhattacharjee (2000) and Taylor & Todd (1995). The items such as, “I feel free to proceed to body image controlled activities” and “Proceeding to body image controlled activities is entirely within my control.” The CR and AVE for this measure are 0.90 and 0.76.

Attitude. The direct measure of attitude was assessed with three semantic differential scales: (a) worth encourage–not worth encourage, (b) negative–positive, (c) useful–useless. Participants gave their responses on 7-point scales with the scale anchors represented by the adjective terms (e.g., 1 = unpleasant, 7 = pleasant), and items were scored such that higher scores indicated a more positive attitude to participate in body image controlled activities. The CR and AVE are separately are 0.94 and 0.85 in this study.

2.4. Results

2.4.1 Measurement model evaluation

We first evaluated item reliability, internal consistency, and discriminant validity for latent constructs in the model. Detailed results in aggregate are reported below.

Item reliability. The standard used to measure items reflected the research suggestion of Nunnally (1978) and Bagozzi & Yi (1988) that factor loadings for each observed item of every latent construct should exceed 0.50. All obtained results in our model were significantly higher than 0.66 ($p < 0.001$).

Internal consistency. We used the CR coefficient (Bagozzi & Yi, 1988; Fornell & Larcker, 1981) and AVE (Fornell & Larcker, 1981) to assess the internal consistency of construct measures. While identical to Cronbach’s alpha, the CR coefficient uses the corresponding estimated factor loading to weigh each measure. CR coefficient and AVE estimates above 0.60 and 0.50, respectively, are considered to demonstrate internal consistency. CR and AVE values for all constructs in the model were significantly higher (0.79~0.94 and 0.56~0.85, respectively) than stipulated criteria, indicating good internal consistency.

Discriminant validity. Three different approaches evaluated the discriminant validity of model constructs. A CFA model was built with 6 latent constructs and a total of 20 measures, with results showing good fit with data. Goodness-of-fit statistics for the model were: $\chi^2(224) = 319.93$, NNFI = 0.99, CFI = 0.99, and RMSEA = 0.030. As a first test of discriminant validity, we checked whether correlations among latent constructs were significantly less than one. Lack of the value of 1 appearing in any of the confidence intervals for the ϕ -values (ϕ values \pm two standard errors) evidences discriminant validity (Bagozzi & Yi, 1988). Next, Fornell & Larcker (1981) suggested that the \sqrt{AVE} value of each latent construct should exceed its vertical and horizontal correlation value. We found all correlation values for each latent construct to be less than the \sqrt{AVE} value.

2.4.2 Structural model estimation

We built structural equation models separately for the full sample to test Hypotheses 1-6, and then conducted mediation tests on the full sample to determine robustness. The fit statistics for the full sample model $\chi^2(233) = 447.38$, $p \cong 0.00$, RMSEA = 0.044, NNFI = 0.97, CFI = 0.98 demonstrates the significance of χ^2 ($p < 0.001$), likely a reflection of large sample size. All the other statistics were also within acceptable ranges, indicating good fit to the data.

We found significant support for all path in theory of planned behavior of Ajzen (1991). From subjective norms and perceived behavioral control to intention to participate body image fixed activities by sports, diet, or medicine, with γ coefficient of 0.29 ($p < 0.001$) and 0.26 ($p < 0.001$), respectively, supporting H1 and H2; the path from attitude to intention is also supported with β coefficient of 0.14 ($p < 0.01$), supporting the hypothesis 3. Then, we found body image dissatisfaction ($\beta = 0.28$) to be a significant predictor of behavioral intention; thus H4 was supported. These antecedents explained nearly (35%) of behavioral intention. Finally, in considering the paths from self-identity and climate for attitude toward activity of body image fixed, we found self-identity to be positive and significant ($\gamma = 0.14$, $p < 0.05$) and climate as positive significantly ($\gamma = 0.18$, $p < 0.01$); thus supporting H5 and H6.

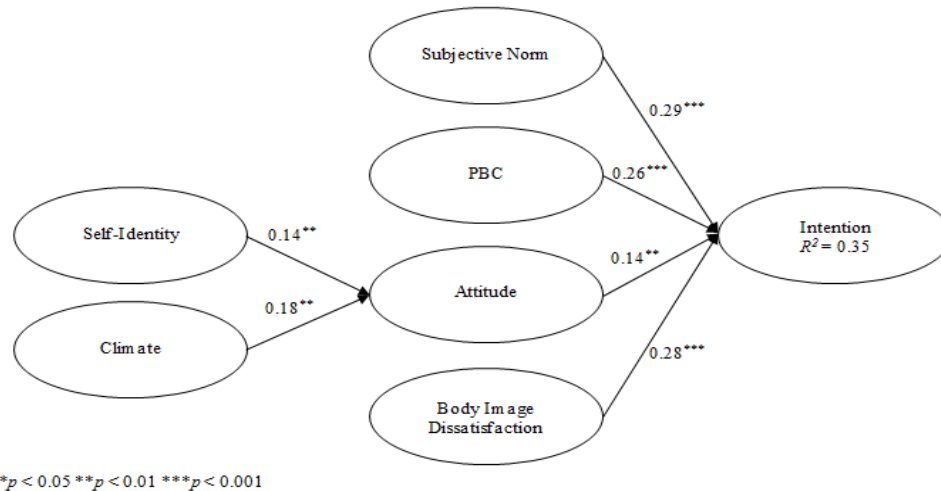


Figure 1: Standardized path coefficients for the model

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國科會補助計畫衍生研發成果推廣資料表

日期:2013/12/24

國科會補助計畫	計畫名稱: 以使用者導向建構差異化3D體型健康管理服務平台
	計畫主持人: 陳碧慧
	計畫編號: 101-2622-H-263-001-CC3 學門領域: 行銷
無研發成果推廣資料	

101 年度專題研究計畫研究成果彙整表

計畫主持人：陳碧慧		計畫編號：101-2622-H-263-001-CC3				計畫名稱：以使用者導向建構差異化 3D 體型健康管理服務平台	
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	0	0	100%	人次	
		博士生	1	1	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	0	100%	篇	
		研究報告/技術報告	0	0	100%		
		研討會論文	1	1	100%		
		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%			

<p>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。)</p>	<p>本計劃主要希望以使用者導向建構差異化 3D 體型健康管理服務平台，體型健康概念是未來健康資訊的重要概念，本研究透過問卷的發展，進行體型健康與體型意識概念模式的探索與建構，藉以提供體型健康相關產業（醫療與美體）對於體型健康服務相關建議與參考。</p>
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	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	

本產學合作計畫研發成果及績效達成情形自評表

成果項目		本產學合作計畫 預估 研究成果及績效指標 (作為本計畫後續管考之參據)	計畫達成情形
技術移轉		預計技轉授權 0 項	完成技轉授權 0 項
專利	國內	預估 0 件	提出申請 0 件，獲得 0 件
	國外	預估 0 件	提出申請 0 件，獲得 0 件
人才培育		博士 0人，畢業任職於業界0人	博士 0人，畢業任職於業界0人
		碩士 0人，畢業任職於業界0人	碩士 0人，畢業任職於業界0人
		其他 0人，畢業任職於業界0人	其他 0人，畢業任職於業界0人
論文著作	國內	期刊論文 0 件	發表期刊論文 0 件
		研討會論文 0 件	發表研討會論文 0 件
		SCI論文 0 件	發表SCI論文 0 件
		專書 0 件	完成專書 0 件
		技術報告 0 件	完成技術報告 0 件
	國外	期刊論文 0 件	發表期刊論文 0 件
		學術論文 0 件	發表學術論文 0 件
		研討會論文 0 件	發表研討會論文 1 件
		SCI/SSCI論文 0 件	發表SCI/SSCI論文 0 件
		專書 0 件	完成專書 0 件
		技術報告 0 件	完成技術報告 0 件
其他協助產業發展之具體績效		新公司或衍生公司 0 家	設立新公司或衍生公司(名稱): 0
<u>計畫產出成果簡述：請以文字敘述計畫非量化產出之技術應用具體效益。(限 600 字以內)</u>		無	