



## An Extended Model of Theory of Planned Behaviour in Predicting Exercise Intention

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### Abstract

The main purpose of the present study was to propose and test an extended model with the addition of perceived need in predicting exercise participation, drawing upon the theory of planned behaviour. Cross-sectional data was collected via self-administered surveys from general adults sample ( $n = 217$ ). The instrument was first validated using exploratory and confirmatory factor analysis to test for unidimensionality, convergent and discriminant validity. Model and hypotheses testing were performed using structural equation modelling (SEM). The extended model accounted for a substantial portion of the variance in exercise intention ( $R^2 = 0.798$ ). Specific findings revealed that: (1) all predictors were significantly correlated with exercise intention; (2) attitude components, perceived control, and perceived need predicted exercise intention; (3) instrumental attitude emerged as the strongest predictor of intention. This study has important implications for marketing practitioners, consumer researchers, and public policy makers interested in the determinants of exercise participation.

**Keywords:** Theory of Planned Behaviour, Perceived need, Exercise, Structural Equation Modelling

### 1. Introduction

There are increasing concerns about health and fitness especially among urbanite and higher social class groups. Various health promotion campaigns organised by government and not-for-profit organisations have increased public awareness of the role of healthy lifestyle in disease prevention. This heightened public awareness has resulted in great business opportunities for many marketers. In marketing sense, healthy lifestyle behaviours are related to a set of activities, interests, and opinions orientated toward the consumption of various goods and services. This healthy lifestyle trend drives demand for various healthier products and services and brings great impact on a number of industries. For instance, in the food industry, numerous low-fat, low-cholesterol, low-sugar, and low-preservative foods have come on the market and have been widely promoted.

Healthy lifestyle behaviours are activities undertaken to protect, promote or maintain health (Steptoe, Wardle, Vinck, Tuomisto, Holte and Wichstrøm 1994) which encompass variety of behaviours such as healthy diet, tobacco-free lifestyle, regular exercise, substance use, cautious preventive practices, weight control and managing stress (Omar 2002). Exercise and dietary behaviours have been recognized as the most visible lifestyle shift among consumers (Kraft and Goodell 1993). Generally, people rely on regular exercise as a means to maintain both their physical health and psychological well-being (Plante and Rodin 1990). Given the fact that exercise is recognized as an important aspect of healthy lifestyles and desired health behaviour, the present paper focuses on exercise participation as one of the component of healthy lifestyle behaviour.

The choices made by individual concerning exercise and fitness activities are a form of consumer behaviour. Little research related to exercise and fitness has been found in the marketing literature. Hence, this paper attempts to develop and test an extended model that explain and predict exercise intentional behaviour from consumer behaviour perspective based on one of the most established social psychology theories, the Theory of Planned Behaviour (TPB, Ajzen 1988, 1991). The TPB has been widely applied to aid the understanding of a variety of health-related behaviours successfully. It provides a systematic and comprehensive framework which allows the assessment of personal, social and psychological effects on individuals' exercise intention.

The contributions of this paper are fourfold. First, it provides understanding of the determinant of exercise intention from consumer behaviour perspective. Second, the original TPB predictors are modelled as multi-components constructs and extended with the addition of perceived need in predicting exercise intention. Third, the relationships between the social cognitive constructs and exercise intention will be addressed, justified, and empirically tested using SEM technique. Lastly, the result provides empirical support for the predictive ability of the extended TPB model. As well as the academic value, this paper has important implications for marketing practitioners, consumer researchers, and public policy makers interested in the determinants of exercise participation.

## 2. Theoretical Background

### 2.1 Exercise participation among Malaysians

Exercise is recognized as an important way to lead a healthy lifestyle. Considerable effort has been put forward to promote exercise among the society as a whole by the Malaysian government agencies and Non-Government Organization (NGOs). Generally, much of the Malaysian population are aware and agree with the benefits of regular physical activity. However, despite all these facts, there are still large percentages of individuals who do not participate in regular exercise. According to the statistic, only 30.9% of Malaysian engages in light and moderate physical activity on regular basis (Ministry of Health 2006), rendering health promotion campaigns ineffective in improving health-related lifestyle behaviours. A study on exercise participation of 4,807 youth in Malaysia revealed the lack of interest in exercise and sports activities participation among youth (Andres 2006). The condition has detrimental effects as the low score for exercise participation indicates the health of youth would be affected in the long run.

Because of the problems associated with a sedentary lifestyle, many researchers in the West have devoted considerable attention in examining the determinants of healthy lifestyle behaviour. However, a review of literature revealed very few studies examining exercise participation in Malaysia. Most of these studies are commercial-like survey or academic research that covers incomplete analysis. Therefore, there is a need to develop more comprehensive framework in understanding the determinants of individual exercise participation.

### 2.2 Theory of planned behaviour

As background to this study, a brief review of the TPB is provided here. The TPB is an extension of the TRA (Fishbein and Ajzen 1975). The TPB extended the TRA by adding the perceived behavioural control (PBC) because the TRA has difficulty in explaining behaviours in which a person does not have volitional control over it. The present study applied TPB instead of TRA to predict exercise behaviour. This is because whether to exercise or not is not entirely under a person's volitional control. There are some control factors that may affect individual's exercise participation such as physical inability, time and money constraint, neighbourhood security, availability of exercise equipments and so on. Hence, it is deemed to be necessary to examine beyond the attitude and subjective norm construct in the TRA but to explore further the control factor that possibly influence individual's exercise participation.

The TPB model posits that intention to perform a given behaviour is the immediate antecedent of that behaviour (Ajzen 2002). Behavioural intention refers to the amount of effort a person exerts to engage in behaviour. It captures the motivation factors necessary to perform a particular behaviour (Courneya, Bobick and Schinke 1999). That is, the more a person intends to carry out the intended behaviour, the more likely he or she would do so (Armitage and Conner 1999). Intention is determined by three conceptually independent variables labelled attitude, subjective norms and PBC. Generally, the more favourable the attitude and subjective norm, and the greater the perceived behavioural control, the stronger should be the individual's intention to perform a particular behaviour (Ajzen 2002).

According to Ajzen (1991), *attitude* toward behaviour is the person's favourable or unfavourable feeling of performing that behaviour and is determined by behavioural beliefs about the outcome of the behaviour and evaluation of the outcome. *Subjective norm* refers to the individual's perceptions of social pressure in performing or not performing a given behaviour and is determined by normative beliefs which assess the social pressures on the individual about a particular behaviour. Finally, *PBC* is thought to be a function of control beliefs about the perceived ease or difficulty of carrying out the intended behaviour and may have both direct and indirect effects on behaviour.

### 2.3 The addition of perceived need

It is observed that many health-related behavioural studies have extended the original TPB model by incorporating additional constructs such as moral norms, social support, past behaviour and personality characteristics. Only very few

researchers have examined perceived need so far. In the health care context, while Van Voorhees, Fogel, Houston, Cooper, Wang and Ford (2006) modelled “low perceived need” for treatment as intention construct based on the TRA model, most of the other studies (e. g. Chisick, Poindexter and York 1998; Rabinowitz, Gross and Feldman 1999; Edlund, Unützer and Curran 2006) focused on examining the demographic and socioeconomic factors that influence individual perceived need. In the food consumption behaviour context, Paisley and Sparks (1998) found expectations of reducing fat intake to be predicted by perceived need independently of the other variables in their extended TPB model.

In agreement with Paisley and Sparks’s (1998) argument that perceived need is distinct from other TPB constructs, Povey, Conner, Sparks, James and Shepherd (2000) examined the discriminant validity of perceived need and other TPB predictors as well as investigating the extent to which perceived need could predict dietary behaviours independently of other TPB variables. However, this was only an exploratory study using single-item measurement for perceived need. Povey, et al. (2000) concluded that there is a need to further examine the discriminant validity between perceived need and the attitude components before any arguments concerning inclusion of this component can be fully supported. Hence, the distinction between attitude and perceived need should be addressed before perceived need is included in the present study.

### 3. Research Model and Hypotheses

The TPB model is a flexible model that opens to the inclusion of additional variables (Ajzen 1991) with aim to increase the proportion of the explained variance and to allow generalisation to other research context. This study incorporates perceived need into the extended TPB model in examining exercise intention. The three TPB constructs are originally and traditionally measured as single concepts (Ajzen 1991). Later, Ajzen (2002) suggests that TPB constructs should comprise of two specific components (e.g. affective attitude and instrumental attitude) and acknowledges the conceptual distinction between these components. Several recent empirical studies (i.e. Rhodes and Courneya 2003b; Hagger and Chatzisarantis 2005; Rhodes, Blanchard and Matheson 2006) support the discriminant validity of these components. Since the present paper attempts to identify the specific TPB components that predict exercise intention, a disaggregated structure of correlated multiple components (Rhodes and Blanchard 2006) is deemed more appropriate. Figure 1 illustrates a research model investigating exercise intention, as constructed based on TPB.

#### 3.1 The effect of attitude components on exercise intention

An individual’s attitude towards performing a particular behaviour is likely to be positive if that person perceives that there are positive outcomes resulting from the behaviour. Using a deductive logic, favourable attitude is likely to increase a person’s intention to participate in a given behaviour. A review of literature shown that attitude has been consistently correlated positively with intention and a good predictor of intention. Most studies in the physical activity and / or exercise domain have reported strong relationships between the attitude construct and behavioural intention (e.g. Norman, Conner and Bell 2000; Rhodes, Jones and Courneya 2002; Symons Downs and Hausenblas 2003; Brickell, Chatzisarantis and Pretty 2006; Rhodes, Macdonald and McKay 2006; Everson, Daley and Ussher 2007).

Considering the prediction of behavioural intentions, attitude has been demonstrated to be a significant predictor of various behavioural intentions. For instance, Hagger, Anderson, Kyriakaki, and Darkings (2007) demonstrated that attitude significantly predicted intentions for exercise, dieting and binge drinking behaviour. Many other studies in the exercise domain found attitude to be significant predictor of exercise intention and emerged as the stronger predictor compared to subjective norm and PBC. A positive relationship between affective and instrumental attitude and intentions to exercise is thus expected. Also, the affective attitude and instrumental attitude are both expected to be significant predictors of exercise intention.

**H1:** Instrumental Attitude will be positively and significantly correlated with and predictive of Exercise Intention

**H2:** Affective Attitude will be positively and significantly correlated with and predictive of Exercise Intention

#### 3.2 The effect of subjective norm components on exercise intention

Most empirical studies revealed a positive relationship between subjective norm components and intended behaviour. A positive relationship between subjective norm components and intentions to exercise is thus expected. However, there are mixed results produced in the literature regarding the predictive ability of subjective norm. While there are many empirical studies support that subjective norm predicted behavioural intention, there were also studies that found subjective norms did not significantly contribute to the prediction of exercise (Rhodes, Blanchard and Matheson 2006). This paper aims to confirm these contradicting findings.

Given the importance of peer influence and family support, exercise participation is also a matter of socialization and social support. The influence significant others have on exercise intention is important and should not be overlooked. The TPB holds that subjective norms predict a person’s intention to perform a particular behaviour. Therefore, it is expected that the more one perceives that significant others favour one’s participation in exercise activities (i.e. the greater the influence of injunctive norm) and the exercise participation typically performed by significant others (i.e. the greater the influence of descriptive norm), the more likely one will intend to exercise. Hence, it is hypothesised that:

**H3:** Injunctive Norm will be positively and significantly correlated with and predictive of Exercise Intention

**H4:** Descriptive Norm will be positively and significantly correlated with and predictive of Exercise Intention

### *3.3 The effect of subjective norm components on exercise intention*

The third social cognitive determinant is PBC, conceptualized in the present paper as an individual's perception of the amount of control (i.e. perceived controllability) one has in terms of the anticipated impediments and obstacles as well as one's perceived capabilities and confidence (i.e. perceived self-efficacy) to participate in exercise activities during leisure time. Ajzen (1991) predicts that PBC influences a person's intention to perform a given behaviour. Using a deductive logic, an individual's behavioural intention tend to increase when there is increase in that person's confidence level and perceptions of the amount of control he or she has over that particular behaviour. There is a good deal of evidence to show that PBC has an association with behavioural intention and was found to improve the prediction of intention in a variety of contexts. Hence, it was hypothesised that:

**H5:** Self-efficacy will be positively and significantly correlated with and predictive of Exercise Intention

**H6:** Perceived Controllability will be positively and significantly correlated with and predictive of Exercise Intention

Despite the importance of perceived need construct, it has been a largely neglected concept in the public policy makers and health-related marketers' strategic considerations. It is evident by the fact that there has been only limited research examining perceived need and this has focused on health care and food consumption. Given the potential significance of perceived need construct in healthcare system management, there is a need to better ascertain the nature of its relationship with exercise intentions. The role of perceived need within the TPB is extended to exercise domain in the present paper. The link between perceived need and exercise intention is expected to hold based on the work of Povey, et al. (2000). It is hypothesized that:

**H7:** Perceived Need will be positively and significantly correlated with and predictive of Exercise Intention

## **4. Research Method**

To examine the effects of perceived need and TPB on an individual's intention to exercise, a cross-sectional survey was employed to test the research model. The research instrument, sampling, and data collection method are designed as below.

### *4.1 Instrument development and pre-test*

Regarding instrument construction, all items were adapted from previously published work with necessary wording changes. Specifically, items measuring attitude and PBC components were adapted from Hagger and Chatzisarantis (2005) and Rhodes and Courneya (2003a), whereas items measuring subjective norm components were taken from Rhodes, Blanchard and Matheson (2006). Measurements of exercise intention were derived from Hagger and Chatzisarantis (2005) and Rhodes, Blanchard, Matheson and Coble (2006). Items assessing perceived need were adapted from Payne, Jones and Harris (2004). All items were assessed on 7-point Likert-type scales range from "strongly disagree" to "strongly agree". The background information used to describe the subjects inclusive of gender, age, ethnicity, religion, marital status, level of education, income, and occupation. The questionnaires were pre-tested to ensure clarity and ease of comprehension. Respondents were asked to evaluate the clarity of the wording, ease of comprehension, the level of language in terms of sensitivity, as well as length, format, and instructions for overall survey in order to minimize ambiguities and communication errors. After an explicit discussion with the respondents, several correction and modifications were made in terms of the wording, presentation and structure of the questionnaire.

### *4.2 Sample and data collection*

Data were collected from the subjects using personally administered questionnaires. A verbal consent was obtained from the participant prior to distributing the questionnaire. All participants were informed the study was on voluntary basis, and that information provided will be kept confidential. A small souvenir was offered to participants in order to encourage more participation. The exercise of data collection was conducted both during weekdays and weekends. Exercise is an urban phenomenon; it is thus justifiable for the present study to be conducted in the Klang Valley areas since it is the largest urban centre in Malaysia. Participants for the present study were general adult (18 to 65 years of age) recruited through informal contact. To provide an adequate level of confidence in this study, a sample size of 300 respondents was targeted. Of 600 questionnaires sent out, 232 responses were returned for a response rate of 38.7%. Of these returns, only 217 completed questionnaires were usable for the data analyses. The descriptive characteristics of the respondents are shown in Table 1.

## **5. Results and Discussions**

The structural equation modelling (SEM) was used for model and hypotheses testing following the two-stage approach suggested by Anderson and Gerbing (1982) using AMOS version 7.0. First, a measurement model was created and subject to a series of validity checks. These measurement model validity assessments included fit indices and

unidimensionality assessment, convergent validity, discriminant validity, and construct reliability test. Second, upon establishing the model fit, the significance, direction, and size of each structural parameter were estimated.

### 5.1 Exploratory measurement results

#### 5.1.1 Corrected item-total correlations

The corrected item-total correlation analyses were conducted for each construct. Table 2 shows the corrected item-total correlation scores, which ranged from 0.497 to 0.869, with the exception of one of the injunctive norm items (IN2). Based on the traditional cut-off value of 0.50 for evaluating corrected item-total correlation (Lu, Lai and Cheng 2007), IN2 (0.331) was dropped from further analyses.

#### 5.1.2 Exploratory factor analysis

The dimensions of the scale were examined by factor analysing the items using the principal components analysis with Varimax rotation method. As shown in Table 3, two items representing affective attitude (i.e. AA5 and AA6) that loaded on Factor 6 were dropped from subsequent analysis. Unexpectedly, all items for perceived control and self-efficacy were loaded in Factor 1. The results indicated that the construct of PBC should be measured as single concept as originally stated by Ajzen (1991). The self-efficacy construct was removed from subsequent analysis as its factor loadings were relatively lower compared to perceived control. The factor analysis results further reinforce the notion that two components existed in attitude and subjective norm constructs, however, this did not apply to PBC. Indeed, this result is consistent with Rhodes and colleagues' recent research finding that self-efficacy items do not measure Ajzen's (1991) PBC construct as well as do controllability items. For model testing and analysis, attitude and subjective norm are modelled as two distinct components whilst perceived control is retained as single construct.

#### 5.1.3 Coefficient alpha and reliability

The Cronbach's alpha value for each measure is shown in Table 4. The alpha value for each construct was well above the recommended value of 0.70, which is considered satisfactory for basic research (Nunnally 1978). However, there are several limitations associated with the use of Cronbach's alpha, including the fact that the alpha value is inflated as the larger number of items included in a scale (Sekaran 2000). Additionally, satisfactory Cronbach's alpha value does not indicate unidimensionality of a particular scale (Gerbing and Anderson 1988). Hence, confirmatory factor analysis is employed for the assessment of unidimensionality.

### 5.2 Structural equation modelling

The model fit was assessed by Chi-square and Normed  $\chi^2/\text{df}$  value, coupled with other model fit indices like Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). The recommended cut off value for the goodness of fit indices was based on Hu and Bentler's (1999) recommendation.

#### 5.2.1 Confirmatory factor analysis (CFA)

The present study adopts a two-step approach proposed by Anderson and Gerbing (1988). This approach is strongly preferred because structural analyses are often unreliable if the measurement model is of low reliability and validity (Hair, Black, Babin, Anderson and Tatham 2006). Based on data collected from 217 samples, the measurement model was first revised and confirmed using confirmatory factor analysis. Internal consistency, convergent validity, and discriminant validity were performed to ensure data validity and reliability. Then, the structural model that best fitted the data was identified followed by hypotheses testing.

#### 5.2.2 Assessment of the fit and unidimensionality of the model

A measurement model should be assessed for goodness-of-fit. The literature suggests that, an acceptable ratio for  $\chi^2/\text{df}$  value should be less than 3.0 (Hair, et al 2006). Following common practice, acceptable model fit is indicated by value greater than .90 for CFI, TLI and a value of less than 0.08 for RMSEA. However, a cut-off value close to .95 for TLI, CFI; and a cut-off value close to .06 for RMSEA are needed to support that there is a relatively good fit between the hypothesised model and the observed data (Hu and Bentler 1999). Although the initial measurement model ( $\chi^2 = 965.615$ ,  $\chi^2/\text{df} = 1.791$ , TLI = 0.903, CFI = 0.912, RMSEA = 0.061) yields an acceptable model fit, some modification was made to determine a model that better fit the data. A total of five indicators were eliminated based on modification indices. It is worth noting that the model fit was improved using a conservative strategy, that is, none of the error terms was allowed to covary. Further, the freeing of cross-loadings was also not allowed since the existence of significant cross-loading indicated lack of construct validity (Hair et al. 2006). The revised measurement model fit the data well ( $\chi^2 = 600.147$ ,  $\chi^2/\text{df} = 1.563$ , TLI = 0.937, CFI = 0.945, RMSEA = 0.051).

#### 5.2.3 Convergent validity

To assess convergent validity, the standardised factor loading should be significantly linked to the latent construct and have at least loading estimate of 0.5 and ideally exceed 0.7 (Hair et al. 2006). The CFA results (see Table 5) indicated that each factor loadings of the reflective indicators were statistically significant at 0.001 level. In addition, the factor

loadings ranged from 0.554 to 0.898, and no loading was less than the recommended level of 0.50. Additionally, two other criteria were assessed to ensure convergent validity: (1) construct reliability should be greater than 0.7 (Nunnally 1978), and (2) variance extracted (VE) for a construct should be larger than 0.5 to suggest adequate convergent validity (Fornell and Larcker, 1981). As shown in Table 6, the reliability of each construct exceeded the 0.70 threshold, showing high internal consistency. Table 6 also shows that the VE of each construct exceeded the cut-off of 0.5. In sum, all constructs of the measurement model demonstrated adequate reliability and convergent validity.

#### 5.2.4 Discriminant validity

For examining discriminant validity, chi-square difference between two models: the unconstrained model and the constrained model are compared (Bagozzi and Phillips 1982). In the unconstrained model, the covariance between particular two constructs was freely correlated. However, the covariance of a certain two construct was fixed to 1.0 in the constrained model. Two constructs are claimed as having well discriminant validity if the  $\chi^2$  difference between the two models is significant. A series of chi-square difference tests were then conducted and the results are shown in Table 7. The results indicated that all  $\chi^2$  difference test were significant at  $p = .001$ . The chi-square value for unconstrained measurement model was significantly lower than any constrained models with the possible pair of constructs. In sum, the findings revealed good discriminant validity for all constructs. Clearly, the present result confirms the distinction between attitude components and perceived need. Hence, it further supports the inclusion of perceived need into the current model.

#### 5.2.5 Structural model results

The hypothesized structural model was tested using SEM. Each indicator was connected to its theoretical domain in a reflective manner. The structural model included: (a) paths from the TPB components and perceived need to exercise intention; and (b) correlations among the TPB predictors. The structural model was assessed through three main steps. First, the theoretical model should meet the goodness-of-fit to the empirical data satisfactorily based on the same set of fit indexes applied in assessing measurement model. Second, the direction, significance and magnitude of the path corresponding to each hypothesis of the theoretical model were examined. Finally, the squared multiple correlations were examined to determine the proportion of variance that was explained by the exogenous constructs in the theoretical model.

The structural model (see figure 2) demonstrated satisfactory model fit ( $\chi^2 = 630.993$ ,  $\chi^2/df = 1.622$ , TLI = 0.931, CFI = 0.938, RMSEA = 0.054) and was used for hypothesis testing. Although the chi-square was significant as expected due to large sample size, the TLI and CFI index were substantially above the preferred .90 threshold. The absolute fit measure of RMSEA was also below the recommended cut-off of 0.06 to be indicative of good model fit (Hu and Bentler 1999). It was reported that 79.8% of the variance associated with exercise intention was accounted for by its six predictors.

#### 5.2.6 Results of hypothesis testing

An examination of the correlation results revealed that all constructs in the present study were positively correlated with each other as hypothesised. The path coefficients and their significance levels for each link are shown in Table 8. All the paths are significant except the links between the subjective norm components and exercise intention. Although injunctive norm ( $r = .523$ ) and descriptive norm ( $r = .282$ ) had significant bivariate correlation with exercise intention, they had no significant direct effects on exercise intention. Instrumental attitude ( $\beta = .461$ ,  $p < 0.001$ ) emerged to be the most important predictor of exercise intention followed by affective attitude ( $\beta = .377$ ,  $p < 0.001$ ). Perceived control ( $\beta = .170$ ,  $p < .01$ ) and perceived need ( $\beta = .163$ ,  $p < .001$ ) was found to have relatively small effect on exercise intention. Of six hypotheses tested, two hypotheses (H3 and H4) were not supported.

#### 5.2.7 Effect on intention

Overall, the multi-components TPB constructs predicted exercise intention quite well with the exception for the subjective norm components. This is consistent with the finding of Godin and Shephard (1985) that subjective norm failed to contribute reliably to the prediction of physical activity intention. Rhodes and Courneya (2003b) also found neither study using two different sampling identified significant effects on exercise intention for both injunctive and descriptive norm. Similarly, several empirical studies have also demonstrated that subjective norm has consistently exhibited either non-significant or of small significant magnitude when it comes to the prediction of exercise intention (Rhodes, Jones and Courneya 2002; Saunders, Motl, Dowda, Dishman and Pate 2004).

Among all TPB constructs, the attitude components were found to have the strongest effect on exercise intention. In many studies using Ajzen's theory of planned behaviour, attitude has consistently produced the strongest effect on behavioural intention (Ajzen 1991). The results make theoretical sense because instrumental attitude refers to perceived benefit associated with performing exercise activities, and affective attitude reflecting one's feelings (e.g. enjoyment, pleasure, and satisfaction) towards exercising. The more favourable one's attitude (be it instrumental or affective) towards exercising, the greater likelihood of that person to engage in exercise behaviour.

The result indicated that greater perception of control tended to lead to greater likelihood of exercise participation. This finding makes theoretical sense as a person is less likely to exercise if he or she perceives to have less control over the performance of exercise activities (Sheeran, Trafimow and Armitage 2003). Meta-analytic reviews conducted by Godin and Kok (1996) and Armitage and Conner (2001) have supported the positive link between perceived control and behavioural intention. Brickell, Chatzisarantis and Pretty's (2006) study attempted to examine the utility of the TPB in exercise domain also found the control factor made a significant contribution to the prediction of exercise intention. Lastly, consistent with the finding of Povey, et al. (2000), the role of perceived need in predicting exercise intention is supported in the present study.

## 6. Conclusion and Implications

Greater understanding of factors that lead to exercise behaviour is invaluable in the planning and implementation of effective strategies and interventions seeking to increase general public exercise participation. The empirical findings of the present paper offer several implications for consumer researchers. First, the discriminant validity between perceived need and attitude components is supported and hence the assessment of the role of perceived need in predicting other healthy lifestyle behaviour is warranted. Second, the poor performance of subjective components may partly due to lack of clarity in the conceptualisation and measurement of the construct. For instance, specific source of reference, types of social influence and the nature of influence were not stated clearly (Saunders, et al. 2004). Third, the PBC construct is the most controversial TPB predictor; researchers have failed to reach consensus about the definition of control factor. The present finding suggests that PBC should be measured as single control concept as originally stated by Ajzen (1991).

The present paper also offers substantial insights to marketing practitioners and public policy maker interested in persuading general population to adopt healthier lifestyle. The present paper has identified attitude, perception of individual control and perceived need to be important factors when addressing marketing strategies tactics. For instance, fitness centre operators should employ a multifaceted approach that take into account such factors in marketing planning and execution in order to maintain customer loyalty in the long term. In view of the rising advertising and promotion costs, effectively tailored messages that aim at promoting exercise could help in optimising limited budgets and resources. Attitude toward exercise participation was clearly contributed the most to the prediction of intention to exercise in the present study. The practical implication here is that interventions strategies targeting attitude would certainly improve individual exercise intentions and subsequent behaviour. Lastly, perceived opportunities and resources available do play a role in influencing a person's decision to change their behavioural intention. For instance, perceived price (i.e. membership fees) and availability (i.e. convenience) may be potential impediment to join fitness clubs. Further research into the factors underlying the perception of control would certainly be beneficial to marketers and public policy makers.

This study has several limitations. First, the link between intention-actual behaviour as delineated in the TPB model was not addressed. The assessment of actual exercise behaviour could enhance the validity of the study, but such attempt requires longitudinal study which is often difficult and costly to conduct. Second, the investigation of antecedents of attitudes, subjective norm and perceived control as delineated in the TPB model would have provided more precise information that is important to the development of a marketing and health promotion strategy. Third, samples for the present study were drawn from metropolitan areas. However, there might be social and behavioural differences between rural and urban dweller. Fourth, exercise is not a sufficient measure of healthy lifestyle behaviour.

Future research should include the measure of actual exercise behaviour and exploring the antecedents of attitude, subjective norm, and perceived control so that more in-depth insights could be obtained in understanding these TPB measures. Since there might be difference in terms of social and behavioural aspects between rural and urban dweller, future research should also replicate the study to other states in Malaysia. Further, the attempt to investigate other consumer healthy lifestyle behaviours such as healthy eating, tobacco-free lifestyle, substance use, health preventive practices, and weight control is necessary to explore more comprehensive aspect of healthy lifestyle. Lastly, it is recommended that, in addition to replicating the study so as to confirm the findings in other settings, future research should explore the nature and extent of the impact of other possible variables on exercise behaviour such as environmental factor.

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Table 1. Profile of Respondents

| Demographic Variables | Description                       | Frequency | Percentage |
|-----------------------|-----------------------------------|-----------|------------|
| Gender                | Male                              | 113       | 52.1       |
|                       | Female                            | 104       | 47.9       |
| Age                   | Below 20                          | 19        | 8.8        |
|                       | 20 - 29                           | 99        | 45.6       |
|                       | 30 - 39                           | 54        | 24.9       |
|                       | 40 - 49                           | 33        | 15.2       |
|                       | Above 50                          | 12        | 5.5        |
| Race                  | Malay                             | 99        | 45.6       |
|                       | Chinese                           | 74        | 34.1       |
|                       | Indian                            | 44        | 20.3       |
| Religion              | Islam                             | 101       | 46.5       |
|                       | Buddhism/Taoism                   | 50        | 23.0       |
|                       | Hinduism                          | 21        | 9.7        |
|                       | Christianity                      | 41        | 18.9       |
|                       | Others                            | 4         | 1.8        |
| Marital Status        | Single                            | 127       | 58.5       |
|                       | Married without children          | 13        | 6.0        |
|                       | Married with children             | 72        | 33.2       |
|                       | Divorced / Widowed                | 5         | 2.3        |
| Education Level       | PMR/SRP/LCE or below              | 8         | 3.7        |
|                       | SPM/SPVM/MCE/O-Level              | 49        | 22.6       |
|                       | STPM/HSC/A-Level                  | 11        | 5.1        |
|                       | College Diploma                   | 44        | 20.3       |
|                       | University or Professional Degree | 105       | 48.4       |
| Income Level          | Below RM1000                      | 20        | 9.2        |
|                       | RM1000 - RM2999                   | 69        | 31.8       |
|                       | RM3000 - RM4999                   | 47        | 21.7       |
|                       | RM5000 - RM6999                   | 16        | 7.4        |
|                       | RM7000 - RM8999                   | 7         | 3.2        |
|                       | Above RM9000                      | 4         | 1.8        |
|                       | Not Applicable                    | 54        | 24.9       |
| Occupation            | Professional/Managerial Position  | 26        | 12.0       |
|                       | Middle Level Manager              | 26        | 12.0       |
|                       | Executive/Technician/Production   | 82        | 37.8       |
|                       | Own Business                      | 13        | 6.0        |
|                       | Student                           | 60        | 27.6       |
|                       | Housewife / Retired or unemployed | 10        | 4.6        |

Table 2. Corrected Item-total Correlations (CITC)

| Construct             | Item | CITC  | Construct                 | Item | CITC  |
|-----------------------|------|-------|---------------------------|------|-------|
| Instrumental Attitude | IA1  | 0.659 | Perceived Control         | PC1  | 0.729 |
|                       | IA2  | 0.556 |                           | PC2  | 0.790 |
|                       | IA3  | 0.709 |                           | PC3  | 0.713 |
|                       | IA4  | 0.578 |                           | PC4  | 0.800 |
|                       | IA5  | 0.654 |                           | PC5  | 0.790 |
|                       | IA6  | 0.683 |                           | PC6  | 0.729 |
| Affective Attitude    | AA1  | 0.715 | Self-efficacy             | SE1  | 0.652 |
|                       | AA2  | 0.671 |                           | SE2  | 0.592 |
|                       | AA3  | 0.718 |                           | SE3  | 0.799 |
|                       | AA4  | 0.772 |                           | SE4  | 0.743 |
|                       | AA5  | 0.548 |                           | SE5  | 0.595 |
|                       | AA6  | 0.515 | Exercise Intention        | I1   | 0.739 |
| Injunctive Norm       | IN1  | 0.588 |                           | I2   | 0.729 |
|                       | IN2  | 0.331 |                           | I3   | 0.774 |
|                       | IN3  | 0.663 |                           | I4   | 0.727 |
|                       | IN4  | 0.528 |                           | I5   | 0.719 |
|                       | IN5  | 0.652 |                           | I6   | 0.777 |
| Descriptive Norm      | DN1  | 0.805 |                           | I7   | 0.636 |
|                       | DN2  | 0.836 | Perceived Need            | PN1  | 0.497 |
|                       | DN3  | 0.869 |                           | PN2  | 0.735 |
|                       | DN4  | 0.867 |                           | PN3  | 0.661 |
|                       | DN5  | 0.774 | Total number of items: 43 |      |       |

Table 3. Rotated Factor Matrix for Social Cognitive Statements

| Items          | Factors |        |       |       |       |       |
|----------------|---------|--------|-------|-------|-------|-------|
|                | F1      | F2     | F3    | F4    | F5    | F6    |
| IA1            | .175    | .126   | .355  | .652  | .174  | -.091 |
| IA2            | .182    | .010   | .073  | .666  | .019  | .353  |
| IA3            | .236    | .127   | .391  | .651  | .185  | -.015 |
| IA4            | .142    | -.029  | .011  | .726  | .039  | .366  |
| IA5            | .221    | .173   | .263  | .623  | .261  | .047  |
| IA6            | .308    | -.038  | .338  | .646  | .179  | -.107 |
| AA1            | .163    | .042   | .762  | .257  | .125  | .160  |
| AA2            | .239    | .156   | .750  | .105  | .031  | .158  |
| AA3            | .192    | .010   | .786  | .236  | .127  | .138  |
| AA4            | .216    | .057   | .807  | .225  | .082  | .175  |
| AA5            | .268    | .088   | .262  | .204  | .094  | .730  |
| AA6            | .103    | .025   | .312  | .100  | .072  | .778  |
| IN1            | .072    | .126   | .223  | .156  | .708  | -.017 |
| IN3            | .125    | .143   | .158  | .234  | .744  | .072  |
| IN4            | .136    | .341   | -.034 | -.035 | .683  | .096  |
| IN5            | .179    | .071   | .007  | .132  | .806  | .028  |
| DN1            | .169    | .850   | .067  | .096  | .100  | -.017 |
| DN2            | .139    | .856   | .094  | .089  | .224  | -.009 |
| DN3            | .163    | .905   | .005  | -.016 | .095  | -.018 |
| DN4            | .218    | .878   | .064  | .005  | .158  | .007  |
| DN5            | .238    | .792   | .081  | .093  | .091  | .196  |
| PC1            | .766    | .082   | -.001 | .112  | .018  | .207  |
| PC2            | .807    | .160   | .092  | .099  | .086  | .032  |
| PC3            | .714    | .249   | .254  | .138  | .155  | .031  |
| PC4            | .819    | .192   | .168  | -.016 | .084  | -.013 |
| PC5            | .650    | .126   | .127  | .233  | .032  | -.026 |
| PC6            | .759    | .070   | -.003 | .208  | -.019 | .229  |
| SE1            | .718    | .166   | .125  | .119  | .002  | .226  |
| SE2            | .616    | .144   | .069  | .191  | .120  | .026  |
| SE3            | .718    | .132   | .296  | .160  | .213  | .083  |
| SE4            | .605    | .097   | .259  | .170  | .362  | .097  |
| SE5            | .618    | .035   | .243  | .085  | .227  | -.102 |
| Eigen Values   | 11.216  | 3.548  | 2.619 | 1.778 | 1.381 | 1.236 |
| Total Variance | 35.05   | 11.087 | 8.185 | 5.557 | 4.315 | 3.863 |

Table 4. Reliability test

| Construct             | No. of item | Cronbach's Alpha |
|-----------------------|-------------|------------------|
| Instrumental Attitude | 6           | 0.853            |
| Affective Attitude    | 4           | 0.887            |
| Injunctive Norm       | 4           | 0.792            |
| Descriptive Norm      | 5           | 0.936            |
| Perceived Control     | 6           | 0.901            |
| Exercise Intention    | 7           | 0.910            |
| Perceived Need        | 3           | 0.783            |

Table 5. Parameter estimates, critical ratios, and item reliability for the revised measurement model

| Latent Constructs     | Items | Unstandardised Loading | Standardised Loading | Standard Error | Critical Ratio <sup>a</sup> | Item Reliability |
|-----------------------|-------|------------------------|----------------------|----------------|-----------------------------|------------------|
| Instrumental Attitude | IA6   | 1.000                  | .754                 | -              | - <sup>b</sup>              | .569             |
|                       | IA5   | 1.022                  | .734                 | .096           | 10.653                      | .539             |
|                       | IA4   | .636                   | .554                 | .081           | 7.882                       | .306             |
|                       | IA3   | 1.049                  | .794                 | .091           | 11.579                      | .630             |
|                       | IA1   | 1.097                  | .749                 | .101           | 10.885                      | .561             |
| Affective Attitude    | AA4   | 1.000                  | .863                 | -              | -                           | .744             |
|                       | AA3   | .985                   | .824                 | .066           | 14.821                      | .678             |
|                       | AA2   | .943                   | .752                 | .073           | 12.917                      | .566             |
|                       | AA1   | 1.016                  | .822                 | .069           | 14.776                      | .676             |
| Injunctive Norm       | IN5   | 1.000                  | .719                 | -              | -                           | .517             |
|                       | IN3   | 1.198                  | .854                 | .122           | 9.843                       | .730             |
|                       | IN1   | 1.115                  | .661                 | .129           | 8.624                       | .436             |
| Descriptive Norm      | DN5   | 1.000                  | .807                 | -              | -                           | .651             |
|                       | DN4   | 1.240                  | .898                 | .080           | 15.492                      | .806             |
|                       | DN2   | 1.143                  | .884                 | .075           | 15.189                      | .781             |
|                       | DN1   | 1.162                  | .825                 | .084           | 13.816                      | .680             |
| Perceived Control     | PC5   | .840                   | .624                 | .097           | 8.666                       | .390             |
|                       | PC4   | 1.149                  | .886                 | .096           | 12.015                      | .784             |
|                       | PC2   | 1.210                  | .894                 | .100           | 12.085                      | .800             |
|                       | PC1   | 1.000                  | .707                 | -              | -                           | .500             |
| Exercise Intention    | INT7  | 1.000                  | .672                 | -              | -                           | .451             |
|                       | INT6  | 1.421                  | .826                 | .131           | 10.866                      | .683             |
|                       | INT5  | 1.355                  | .776                 | .132           | 10.297                      | .602             |
|                       | INT4  | 1.351                  | .762                 | .133           | 10.131                      | .580             |
|                       | INT3  | 1.341                  | .805                 | .126           | 10.624                      | .647             |
|                       | INT2  | 1.283                  | .756                 | .128           | 10.064                      | .572             |
|                       | INT1  | 1.350                  | .786                 | .130           | 10.408                      | .617             |
| Perceived Need        | PN3   | 1.000                  | .784                 | -              | -                           | .614             |
|                       | PN2   | 1.159                  | .896                 | .112           | 10.310                      | .804             |
|                       | PN1   | .575                   | .563                 | .072           | 7.977                       | .317             |

Fit indices:  $\chi^2 = 600.147$ ,  $\chi^2/df = 1.563$ , TLI = 0.937, CFI = 0.945, RMSEA = 0.051

Note: <sup>a</sup> C.R. is the critical ratio obtained by dividing the estimate of the covariance by its standard error. A value exceeding 1.96 represents significance level of 0.05; <sup>b</sup> some critical ratios were not calculated because loading was set to 1 to fix construct variance; All item loadings in CFA model were significant at 0.001 level.

Table 6. Confirmatory Factor Analysis for Convergent Validity

| Construct             | No. of Items | Item Loading  | Reliability | Variance Extracted |
|-----------------------|--------------|---------------|-------------|--------------------|
| Instrumental Attitude | 5            | 0.554 – 0.794 | 0.843       | 0.521              |
| Affective Attitude    | 4            | 0.752 – 0.863 | 0.887       | 0.666              |
| Injunctive Norm       | 3            | 0.661 – 0.854 | 0.774       | 0.561              |
| Descriptive Norm      | 4            | 0.807 – 0.898 | 0.914       | 0.729              |
| Perceived Control     | 4            | 0.624 – 0.894 | 0.858       | 0.618              |
| Exercise Intention    | 7            | 0.672 – 0.826 | 0.910       | 0.593              |
| Perceived Need        | 3            | 0.563 – 0.896 | 0.783       | 0.578              |

Table 7. Measurement Model Fit: Discriminant Validity

| Links    | Fixed correlation |            | Freely estimated correlation |      |            | Chi square difference |
|----------|-------------------|------------|------------------------------|------|------------|-----------------------|
|          | d.f.              | Chi square | Correlation                  | d.f. | Chi square |                       |
| IA – AA  | 27                | 91.622     | .71                          | 26   | 39.163     | 52.46                 |
| IA – IN  | 20                | 106.23     | .55                          | 19   | 43.31      | 62.92                 |
| IA – DN  | 44                | 200.89     | .26                          | 43   | 120.18     | 80.71                 |
| IA – PC  | 27                | 96.95      | .47                          | 26   | 37.19      | 59.76                 |
| IA – INT | 54                | 193.146    | .83                          | 53   | 126.43     | 66.72                 |
| IA – PN  | 27                | 158.748    | .33                          | 26   | 73.702     | 85.05                 |
| AA – IN  | 14                | 76.037     | .41                          | 13   | 17.21      | 58.827                |
| AA – DN  | 20                | 86.81      | .25                          | 19   | 26.37      | 60.44                 |
| AA – PC  | 20                | 71.72      | .42                          | 19   | 24.37      | 47.35                 |
| AA – INT | 44                | 143.33     | .80                          | 43   | 94.07      | 49.26                 |
| AA – PN  | 14                | 83.73      | .35                          | 13   | 22.91      | 60.82                 |
| IN – DN  | 14                | 60.216     | .39                          | 13   | 18.199     | 42.02                 |
| IN – PC  | 14                | 81.69      | .22                          | 13   | 30.027     | 51.66                 |
| IN – INT | 35                | 145.02     | .24                          | 34   | 76.13      | 68.89                 |
| IN – PN  | 9                 | 78.36      | .20                          | 8    | 19.15      | 59.21                 |
| DN – PC  | 20                | 68.94      | .36                          | 19   | 36.84      | 32.10                 |
| DN – INT | 44                | 163.04     | .16                          | 43   | 83.64      | 79.4                  |
| DN – PN  | 14                | 76.85      | .12                          | 13   | 11.874     | 64.976                |
| PC – INT | 44                | 142.29     | .27                          | 43   | 84.815     | 57.475                |
| PC – PN  | 14                | 80.86      | .13                          | 13   | 13.534     | 67.326                |
| INT – PN | 35                | 150.17     | .22                          | 34   | 77.117     | 73.05                 |

Table 8. The Results of Hypotheses Testing

| Paths        | Hypothesised | $\beta$ | SE   | Critical ratio | P    | Supported |
|--------------|--------------|---------|------|----------------|------|-----------|
| H1: IA – INT | +            | .461    | .085 | 4.916          | ***  | Yes       |
| H2: AA – INT | +            | .377    | .054 | 4.881          | ***  | Yes       |
| H3: IN – INT | +            | .054    | .045 | .890           | .373 | No        |
| H4: DN – INT | +            | -.063   | .030 | -1.236         | .216 | No        |
| H6: PC – INT | +            | .170    | .037 | 2.996          | .003 | Yes       |
| H7: PN – INT | +            | .163    | .033 | 3.542          | ***  | Yes       |

Note:  $\beta$  = standardised regression weight; SE = standard error; Hypothesis 5 was not tested as self-efficacy was dropped from further analysis based on exploratory factor analyses

\*\*\*  $p < 0.001$

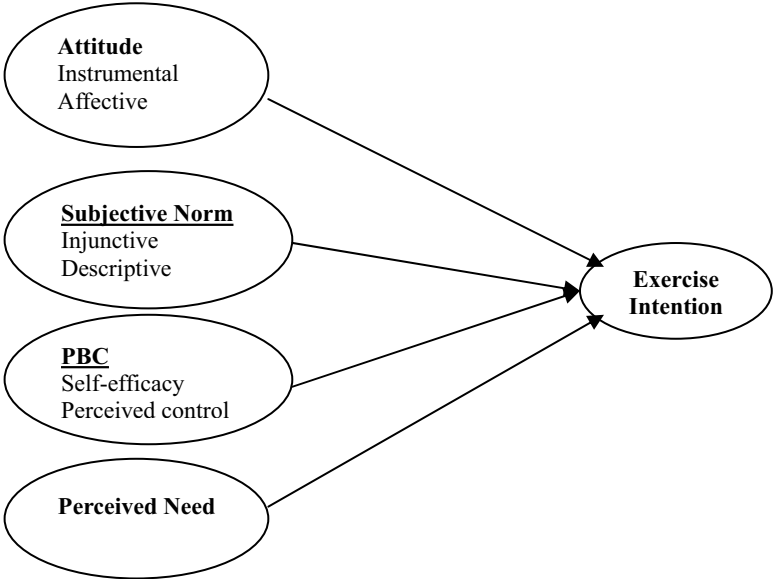


Figure 1. The research model

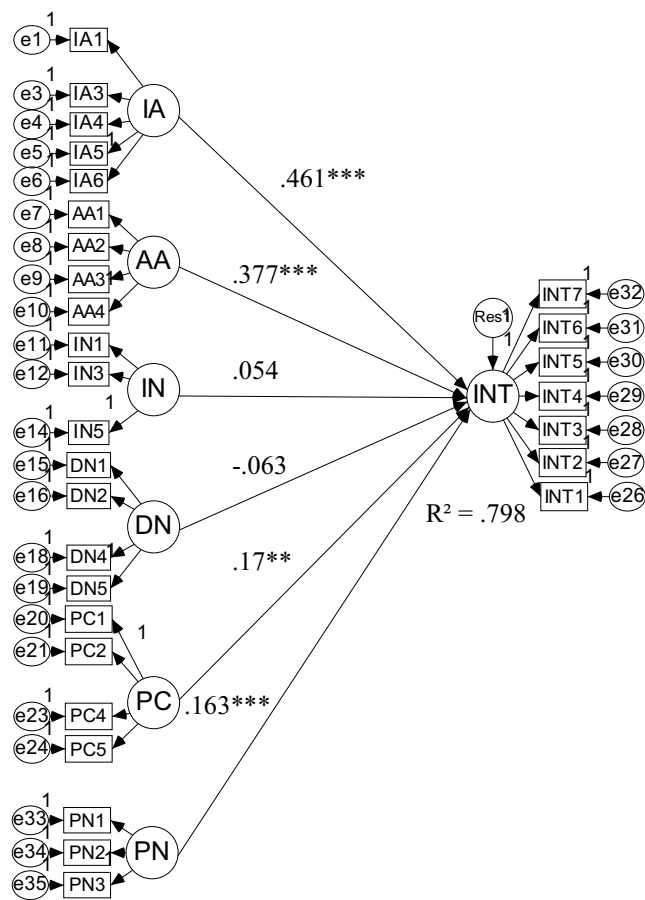


Figure 2. Results of the research model.

Note: ( $\chi^2 = 630.993$ ,  $\chi^2/df = 1.622$ , TLI = 0.931, CFI = 0.938, RMSEA = 0.054)