Chapter 8: Discussion and Conclusion

This chapter provides an interpretation and discussion of the study of social cognitive and personality factors on exercise behaviour. Following an overview of the present research, a brief summary of the research findings will be provided. Discussion will address several specific research questions posed in this study and will be focused on the structural model testing and exercise group differences. Next, theoretical, methodological, and practical contributions and implications of the study will be discussed. Lastly, limitations of the study and suggestions for future research are also delineated.

8.1 Summary of Research

Consumer health lifestyle has been a concern for many parties including the government, general public, and marketing practitioners. The present study focuses on exercise as one of the aspects of healthy lifestyle behaviour since it is regarded as an important component of healthy lifestyles and desired public health behaviour. The evolvement of consumer healthy lifestyle certainly creates new opportunities and at the same time posing marketing challenges to marketers in the health-related industries such as fitness clubs, food, health care, insurance, and medical services. Despite various government efforts in health promotion and public awareness of the potential risks associated with sedentary lifestyle, the exercise participation among Malaysians is low. Hence, it is reasonable to assume that other factors beyond health knowledge and awareness may determine individual exercise behaviour. Clearly, the increasing health care costs and public health concern as well as the knowledge contribute to the marketing field provide a strong reason for this research to look into the determinants of exercise behaviour.
In the health literature, several behavioural change models such as the health belief model, protection motivation theory, theory of reasoned action and planned behaviour, self-efficacy theory, locus of control, self-determination theory, transtheoretical model of stages of change have been popularly examined. Among these models, the theory of planned behaviour (TPB, Ajzen 1991) has been adopted as the underpinning theory of the study. The rationale for choosing the TPB model has been well explained in Chapter 4. Although the TPB model has received great attention in the exercise domain, mixed results have been produced. These conflicting results indicate a need for clarification of conceptualisation and measurement of the TPB predictors. This research issue has been addressed in the present study.

Also, the sufficiency of the TPB model has been questioned. It is observed that the role of personality has received increasing attention in exercise literature. Past studies have initially focused on personality as an outcome of physical activity. Later, researchers have shifted their focus to examine personality factors as the antecedents of exercise behaviour. There are also researchers who have either compared the personalities of inactive/unfit persons to active/fit persons or examined the role of personality in predicting exercise adherence. In most past studies, numerous factors derived intuitively have been included in the original TPB model with an aim to increase the predictive power of their modified model. However, very few researchers have looked into a more comprehensive and integrative model which enables the examination of factors that influence exercise behaviour simultaneously.

The main thrust of this study is to propose and test an integrative model of exercise behaviour that mainly comprised of social cognitive constructs, personality factors, and behavioural variable. Cross-sectional survey data were collected from general adult samples (n = 512) living in Klang Valley, Malaysia. The main research objectives of the
The present study first contributes to the existing body of knowledge by developing and testing an integrated model of exercise behaviour based on theories developed in the West using structural equation modelling (SEM) technique. This integrative model of social cognitive and personality factors to explore determinants of exercise behaviour is a new application. This study is also the first attempt to examine individual exercise behaviour from consumer behaviour / marketing perspective. A good understanding of factors affecting the decision making, evaluations and behavioural aspect of individual exercise behaviour is expected to help the development of health-related marketing theory.

Besides, this study also extends previous research by: (1) examining the mediating role of exercise intention (which is largely neglected in TPB research) that links social cognitive and personality factors to exercise behaviour using robust statistical technique; (2) examining the relative importance of social cognitive and personality factors in discriminating distinct exercise group membership; (3) providing meaningful and comprehensive demographic differences analyses in social cognitive and personality constructs, an area that has been sufficiently neglected in the exercise literature.
Methodologically, the present study contributes by: (4) comparing the efficacy of a single concept TPB measure versus an aggregated multi-components TPB structure using alternative model testing approach; (5) testing and confirming the overall convergent validity and discriminant validity for the TPB and personality measurement in a single analysis; (6) examining the robustness of the proposed integrative model in its ability to predict exercise behaviour using a different sample.

The present study involves three phases of data analyses. First, the constructs are validated using exploratory measurement assessment tools such as corrected item-total correlation, exploratory factor analyses, and reliability test for internal consistency. The measurement model is then created and tested for unidimensionality, convergent validity, and discriminant validity using confirmatory factor analysis. Second, several preliminary analyses have been conducted (i.e., descriptive statistics, chi-square, independent sample t-test, one-way ANOVA, discriminant analysis, and Pearson correlation coefficients) to provide greater insights to marketers and public policy makers. Lastly, alternative model comparisons are performed using the SEM technique, which aim to: (1) confirm the measurement structure for TPB predictors; (2) to test and confirm the hypothesised partial mediation model. Upon establishing the model fit, the significance, direction, and magnitude of each hypothesised structural parameter are assessed.

8.2 A Brief Summary of the Research Findings

The present findings provided additional information about the relationships between social cognitive construct, personality factors, and exercise behaviour among general adult public. In order to ease the subsequent discussion, a brief summary of the research findings is provided in this section. The data analyses were conducted based on a sample size of 512 respondents. A total of 82 questionnaires were unusable and hence had been excluded from subsequent analyses. An examination of chi-square test has
shown no significant differences between usable and unusable responses in terms of all demographic characteristics. The constructs of agreeableness, perceived self-efficacy and neuroticism as well as several indicators were dropped during the exploratory measurement assessment. An examination of the internal consistency revealed satisfactory reliability with the alpha value ranging from 0.72 to 0.956. The multivariate assumptions analyses using four commonly applied requirements (i.e., tests of normality, homoscedasticity, linearity, and multicollinearity) revealed no violation of assumptions for the empirical data.

The descriptive statistics revealed several highlights of the results: (1) about 35.7% of the respondents were grouped as ‘high active’ exercisers, whilst 64.3% of the respondents were in the ‘low active’ category; (2) among the social cognitive constructs, instrumental attitude had the highest mean score, indicating that respondents had favourable feeling about the perceived benefits of exercise; (3) as for personality factors, the respondents had higher mean score on conscientiousness and extraversion dimension compared to openness to experience; (4) the mean scores for affective attitude, injunctive norm, perceived control and exercise intention were moderate to high, whilst descriptive norm had the lowest mean score.

The results regarding demographic differences in social cognitive and personality factors reveal: (1) an association between social cognitive constructs (except for injunctive norm and perceived control), extraversion, conscientiousness, openness to experience, and gender; (2) age to be significantly related to all main constructs except for descriptive norm and openness to experience; (3) ethnicity differences in instrumental attitude and injunctive norm; (4) religious differences with respect to instrumental attitude, injunctive norm, and exercise behaviour; (5) marital status to have no significant association with all main constructs; (6) education to be significantly related to attitude components,
conscientiousness, and exercise intention; (7) **income** differences only in the injunctive norm measure; (8) significant association between perceived control, extraversion, and **occupation** variable.

Demographically, significant differences were found only in age and occupation between ‘high active’ and ‘low active’ exercisers. Next, significant mean differences were found between ‘high active’ and ‘low active’ exercise groups in all the measures of social cognitive, personality, and exercise behaviour. Specifically, it was found that the ‘high active’ exercise group has considerably greater ratings on all TPB as well as personality factors. The discriminant analysis found exercise behaviour to be the most important factor in discriminating between the two distinct exercise groups, followed by conscientiousness and extraversion. An examination on the Pearson correlations indicated significant positive bivariate correlation between all main constructs studied.

The measurement model assessment using confirmatory factor analysis showed satisfactory final model fit ($\chi^2 = 1131.49$, $\chi^2/df = 1.539$, GFI = 0.903, TLI = 0.969, CFI = 0.972, RMSEA = 0.032). Overall, the required reliability and validity assessment demonstrated strong support for satisfactory convergent validity and discriminant validity. The results of alternative model comparison indicate that attitude and subjective norm constructs achieved better model fit when modelled as disaggregated two-factor structure, whereas perceived control should be modelled as a single concept which comprised of merely the perceived control items. A series of alternative model comparisons further support the hypothesised partially mediated model ($\chi^2 = 1404.665$, $\chi^2/df = 1.885$, GFI = 0.891, TLI = 0.949, CFI = 0.954, RMSEA = 0.042). The total variance in exercise intention explained by the predictors was 80.7%. The proposed model explained a substantial amount of variance in exercise behaviour in that all direct and indirect effects contribute to 42% of total variance.
Overall, the structural model analyses found that attitude components, perceived control, and conscientiousness had significant effects on exercise intention with affective attitude emerged as the strongest predictor of exercise intention. Next, it was found that descriptive norm, perceived control, extraversion, conscientiousness, and exercise intention had significant effects on exercise behaviour. Among all study constructs, conscientiousness emerged to be the strongest predictor of exercise behaviour. Further, it was reported that exercise intention mediates the link between attitude components, perceived control, conscientiousness and exercise behaviour, but the mediating effects were small.

8.3 Discussion: Overview of the Findings

In general, the results of the statistical test have provided support for the usefulness of the proposed integrated model in understanding exercise behaviour. This section addresses the research questions posed in this study. The discussion and interpretation of the findings will first be focused on the efficacy of the proposed model, followed by determining the best measurement structure for the TPB predictors. The discussion related to structural relationships will then be described according to each variable investigated in the present study.

8.3.1 Research Question 1: A Discussion

*RQ1: What is the model efficacy and predictive ability of the proposed integrated model of FFM and TPB in predicting exercise behaviour?*

The first research question examines the model efficacy and predictive ability of the proposed integrative model of social cognitive and personality factors in predicting exercise behaviour. Overall, the proposed integrated model tested using SEM suggests an acceptable fit of the data, indicating the effects within the model can be interpreted with confidence. Additionally, the inclusion of personality factors into the full structural
model did contribute additional variance to the prediction of exercise behaviour. Furthermore, a series of reliability and validity assessments demonstrated strong support for satisfactory convergent validity and discriminant validity for the measurement model.

Several meta-analyses of TPB have supported the predictive ability of the model. For example, Sheppard, Hartwick and Warshaw (1988) support the efficacy of the theory and found average $R^2$ values of .436 for intention and .281 for behaviour. Similarly, Godin and Kok (1996) found TPB model to perform very well for the explanation of both intention (with average $R^2$ of .41) and behaviour (with average $R^2$ of .34) in the health domain. In a meta-analysis of TRA and TPB, Sutton (1998) found that these two models explain an average between 40% and 50% of the variance in intention, and between 19% and 38% of the variance in behaviour. More recently, Armitage and Conner (2001) did a quantitative integration and review of research on the TPB from a database of 185 independent studies published up to the end of 1997. They found TPB predictors to account for 27% and 39% of the variance in behaviour and intention, respectively. These studies seem to support the usefulness of the TPB.

In the present study, the social cognitive components contribute a total explained variance of 82.4% and 37.7% in predicting exercise intention and behaviour, respectively. These results are considerably more impressive than those found in the general TPB literature (see above paragraph). One possible reason for social cognitive constructs to contribute as much as 82% of total explained variance to the prediction of exercise intention may be the inclusion of motivation elements (i.e., ‘… will make an effort to…’, ‘… motivated to…’, and ‘… willing to try hard to…’) into exercise intention measure for the present study (refer to Rhodes et al. 2006). Additionally, the difference may also due to the more superior measurement of disaggregated multi-components structure for attitude and subjective norm components. This inference was
made because the aforementioned meta-analyses were conducted based on databases up to the end of 1990s. Yet, the development of disaggregated multi-components TPB measures is relatively recent.

In the present full structural model, the results indicated that instrumental attitude, affective attitude, perceived control and conscientiousness were significant predictors of exercise intention with a total variance explained of 80.7%. Exercise behaviour is predicted by perceived control, extraversion, conscientiousness and exercise intention, which jointly explained 42.1% of the variance in the full structural model. Among the three social cognitive predictors, only perceived control predicted exercise behaviour. It seemed that perceived control is a more important construct in predicting exercise behaviour than attitude and subjective norm components. The results corroborate with the inclusion of PBC to the TRA as proposed by Ajzen (1991), supporting the use of TPB over the TRA model in the present study.

While the full structural model with the inclusion of personality achieved a multiple squared correlation coefficient (R^2) of 0.421, the TPB model without personality factors reported a multiple squared correlation coefficient of 0.377. Clearly, the three personality factors explained an additional 4.4% of the variance in exercise behaviour. The three personality factors accounted for only a small proportion of the variance in predicting exercise behaviour. Such finding is common because when general personality factors rather than social cognitive construct like attitudes and perceived control related to specific activities are measured (Steptoe et al. 1994).

Conscientiousness emerged as the most important construct in predicting exercise behaviour and its influence on exercise behaviour is greater than all the social cognitive constructs studied. Additionally, the significant contribution of both extraversion and conscientiousness to the prediction of exercise behaviour indicate the complementary
nature of these two personality dimensions in understanding exercise participation (Courneya and Hellsten 1998). The findings clearly supported the inclusion of personality factor in examining exercise behaviour.

In summary, the present results support the proposed integrated model of exercise behaviour based on the TPB and FFM model of personality. Despite greater variance explained in the full structural model of exercise behaviour compared to previous research, there is still some proportions of the variance left unexplained. Proceeding with research that ascertains how these social cognitive and personality factors affect exercise behaviour using a different sampling as well as exploring other potential determinants of exercise behaviour is important.

8.3.2 Research Question 2: A discussion

RQ2: Are the three TPB predictors (i.e., attitude, subjective norm, and PBC) best represented as a single concept or a disaggregated multi-components TPB structure?

The three social cognitive predictors contained in the TPB model are originally and traditionally measured as a single concept (Ajzen 1991). Later, Ajzen (2002b) suggests that each social cognitive construct should comprise of two specific components. Following this, several empirical studies (i.e., Rhodes and Courneya 2003b; Hagger and Chatzisarantis 2005; Rhodes, Blanchard and Matheson 2006) provide support for the discriminant validity of these components. A more recent development to the TPB is the idea to model it as higher-order models of attitudes, subjective norm, and perceived behavioural control (PBC) (Hagger and Chatzisarantis 2005). However, researchers could argue that this higher order structure may overlook the variation in the predictive ability of the differentiated components of attitude, subjective norm, and PBC, and hence defeat the purpose of differentiating them in the first place (Rhodes and Blanchard 2006).
Rhodes, Blanchard and Matheson (2006) found that attitude, subjective norm, and PBC constructs achieve significantly better fit when each of the construct is modelled as disaggregated two-factor structure for undergraduate student sample. Consistent with recent research, the present study provides empirical support for the disaggregated multi-components TPB structure to account for the differentiated attitude and subjective norm constructs. However, contrary to expectation, the present results showed that the PBC construct is better modelled as a single-concept with only the perceived control measures. This is contrary to the research by Rhodes and Courneya’s (2003b) and Rhodes, Blanchard and Matheson (2006). One possible explanation for the inconsistencies regarding the PBC measure could be the sampling, environmental, and cultural differences.

In this case, the attitude components (i.e., instrumental attitude and affective attitude) and subjective norm components (i.e., injunctive norm and descriptive norm) should act as a separate component towards the prediction of exercise intention and behaviour. From a practical perspective, the specific influence instrumental attitude (injunctive norm) has on exercise participation may be different from that of affective attitude (descriptive norm). This point needs to be considered in any health promotion and intervention programme.

The decision to eliminate perceived self-efficacy construct from the study corroborate with Ajzen’s (1991) original conceptualisation of PBC. The concept of PBC was originally conceptualised to capture non-motivational opportunity and resources control factors such as time, skills, and money. Somehow, the perceived self-efficacy items such as ‘confidence’, ‘ease/difficult’, and ‘ability’ do in part capture motivation element along with the aforementioned non-motivational control factor (Rhodes and Courneya 2003b). This explains exactly why the present exploratory factor analysis exhibited that both
perceived control and perceived self-efficacy loaded on one single factor. As the present exercise intention measures also contains motivation element; the inclusion of perceived self-efficacy may be redundant as it would overlapped with the intention measure (Rhodes et al. 2006).

8.3.3 Research Question 3: A Discussion

*RQ3: What is the role of social cognitive and personality constructs in predicting exercise intention and exercise behaviour? Which particular construct exert the strongest influence on the formation of exercise intention and behaviour?*

This section discussed the findings regarding the role of social cognitive and personality factors in predicting exercise behaviour. The predictive ability of social cognitive construct and personality factors to exercise intention and exercise behaviour will be discussed, variable by variable.

(a) Attitude Components: Instrumental Attitude and Affective Attitude

Both instrumental attitude and affective attitude had positive effects on exercise intention. This makes theoretical sense because affective attitude reflecting enjoyment or pleasure associated with performance of the exercise behaviour, and instrumental attitude refers to one’s perceived benefit toward exercising (Rhodes and Courneya 2003b; Payne, Jones and Harris 2004). The more favourable the perception in one’s affective and instrumental attitude toward participating in exercise activities, the greater likelihood that the person will participate in exercise activities. These results are consistent with those of previous research in exercise domain (e.g., Rhodes, Jones and Courneya 2002; Rhodes and Courneya 2003b; Brickell, Chatzisarantis and Pretty 2006).

Among all social cognitive constructs, the attitude components were found to have the strongest effect on exercise intention. The effects of both attitude components had on exercise intention were stronger than any other study constructs including personality
factor. Attitude has long been considered as a major factor influencing individual decision-making (Fishbein and Ajzen 1972). This finding is consistent with the argument that attitude is a core construct in the TPB framework in that the theory will be rejected if attitude does not predict intention (Ajzen 1991).

In many studies using Ajzen’s theory of planned behaviour, the attitude variable has consistently produced the strongest effect on behavioural intention in a wide variety of context (Ajzen 1991). For instance, attitude was the strongest social cognitive predictor in determining reduced-milk consumption intention (Kassem and Lee 2005), behavioural intentions to consume chocolate and meat (Sparks et al. 2001), supplement-taking intention (Conner et al. 2001), online grocery buying intention (Hansen, Jensen and Solgaard 2004), and intentions to attend a hockey game (Cunning and Kwon 2003). Similarly, in the exercise domain, attitude components have been found to be the best predictor of intention to exercise among other social cognitive constructs (e.g., Okun et al. 2003; Symons Downs and Hausenblas 2003).

Although instrumental attitude and affective attitude had positive effects on exercise intention, but their influences on exercise behaviour were not significant. Instead, consistent with Ajzen’s (1991) assertion, exercise intention was found to mediate the relationships between attitude components and exercise behaviour. Theoretically, a person may form very favourable attitude towards exercising and hence has strong intention to do so. However, those people who intended to exercise may or may not actually do so eventually. This is possibly due to the lack of facilitating factors or the existence of constraints (i.e., perceived control factor) that refrains them from exercising. Empirically, the present finding is consistent with Hagger and Chatzisarantis (2005) who found exercise intention to mediate the relationships between attitude components and exercise behaviour.
This study found that, comparing to instrumental attitude, the component of affective attitude had relatively stronger effect on exercise intention. This is consistent with Ajzen and Timko’s (1986) findings that affective attitude has greater effects on health behavioural intention than instrumental attitude. More specifically, this finding is similar to a growing body of research using the TPB to examine exercise behaviour (e.g., Rhodes and Courneya 2003b; Rhodes, Courneya and Jones 2004; Rhodes et al. 2006; Rhodes, Blanchard and Matheson 2006). This finding has important implications on decision making for marketing practitioners and public policy makers especially decisions related to communication strategies. Further research to explore the antecedents of attitude as well as the role of affective attitude in influencing other healthy lifestyle behaviour is warrant.

(b) Subjective Norm Components: Injunctive Norm and Descriptive Norm

In terms of measurement, a disaggregated multi-component measurement model performed better than an aggregation of the injunctive and descriptive norm components into a single concept for the present sample. In terms of prediction ability, subjective norm components contributed poorly to the prediction of both exercise intention and exercise behaviour. Despite the significant positive correlation between subjective norm components and exercise intention and exercise behaviour; both subjective norm components had significant effects on neither the exercise intention nor exercise behaviour.

Strictly speaking, descriptive norm ($\beta= 0.075$) had a marginal significant effect on exercise behaviour, however, the effect was too trivial to be important. Further, no significant indirect effects of subjective norm components on exercise behaviour through exercise intention were found. Nevertheless, having such poor performance for subjective norm in the prediction of exercise behaviour did not suggest the present model
is disconfirmed. There is nothing in the TPB theory to suggest that all TPB predictors will each make a significant contribution to the prediction of intention (Ajzen 1991).

The relative weight of these social cognitive constructs in determining intention is expected to vary across behaviour, situation and population (Ryan and Bonfield 1975; Miniard and Cohen 1979). For example, certain group of sample may be more inclined to social influence and therefore may perceive greater social pressure than other sampling groups. Similarly, certain behaviours such as purchase behaviour of luxury products may be more susceptible to reference group influence. Besides, cultural differences may also play an important role here (Choo, Chung and Pysarchik 2004). It is not surprising that one or another of the social cognitive predictors may be found to predict intention poorly or insignificantly in some circumstances (Ajzen 1991). The results pertaining to the less important role of subjective norm may infer that the subjects in the present study are generally not sensitive to social influence when it comes to exercise participation. This inference is reflected in the relatively lower mean score for descriptive norm.

Indeed, the present result adds to a collection of exercise literature that found subjective norm to be a poor predictor of exercise intention (e.g., Rhodes, Jones and Courneya 2002; Symons Downs and Hausenblas 2003; Brickell, Chatzisarantis and Pretty 2006; Rhodes, Blanchard and Matheson 2006). Several scholars agree that the normative component of the TPB is a relatively weaker predictor of behavioural intentions (Ajzen 1991; Armitage and Conner 1999a). Because of the poor performance of subjective norm construct, several researchers have diverted their attention to other social related constructs such as social support (Rhodes, Jones and Courneya 2002) and social provision (Saunders et al. 2004). This may serve as an avenue for further research.
(c) Perceived Control

The most controversial issue regarding PBC construct is whether it influences behaviour directly or through behavioural intention. This lies in whether the given behaviour is volitional or non-volitional (Ajzen 1991). Most behaviour located at some point along a continuum that ranges from complete control to no control at all. Complete control implies there are no obstacles in performing a given behaviour. A person is said to have no control if performance of a particular behaviour requires time, opportunities, resources, or skills that the person is lacking (Godin and Kok 1996).

As originally formulated by Ajzen (1991), when the behaviour studied is not completely under the volitional control of the individual, PBC can influence behaviour directly (i.e., not mediated by intention) to the extent that PBC accurately reflects actual control and ability. On the other hand, stronger intention will be formed if a person perceives he or she has high volitional control toward performing a given behaviour; and the influence of perceived control on actual behaviour is completely mediated by behaviour intention (Notani 1998).

Perceived control had an effect on both exercise intention and exercise behaviour. Yet, the effect of perceived control on exercise behaviour is also mediated through exercise intention. The direct effect of perceived control had on exercise behaviour is greater than the indirect effect. Such results imply that exercise participation is neither the extreme end of complete volitional or non-volitional but instead suggest that exercise behaviour is a moderately controllable behaviour. This inference is supported by the mean score value of perceived control scale. The result also makes theoretical sense because whether or not a person exercise may not be totally under his or her volitional control. There may be some factors that restraint a person from exercising. For instance, time constraint has been stated as the main problems for not exercising (Mohd Nordin et al. 2003).
According to Ajzen and Madden (1986, p. 459), a person’s performance of a given behaviour is dependent on his or her intention as well as the control factor over the behaviour; control factor can predict behaviour independent of intention “to the extent that it reflects actual control with some degree of accuracy”. As a person’s perceived control approaches the actual control (i.e., able to perceive control level accurately), perceived control will have greater direct influence on exercise behaviour (Ajzen 1991). Alternatively, the direct and indirect effect of perceived control had on exercise behaviour may indicate that subjects in the present study are generally not completely accurate at judging how much control they actually possess over exercising. It is also possible that as the respondents have greater familiarity with exercise participation, the perceptions of control will eventually come close or equal to actual control. If this happen, perceived control will have a direct effect on exercise behaviour, not mediated by exercise intention (Notani 1998).

(d) Extraversion

Extraversion was found to be significantly and positively correlated with exercise intention and behaviour. The magnitudes of the relationship between extraversion and exercise intention (r = .677) and behaviour (r = .611) were considered high. The insignificant path between extraversion and exercise intention did not permit the mediating effect of exercise intention (Baron and Kenny 1986). As such, extraversion only had significant direct positive effect on exercise behaviour.

Research using the FFM model found extraversion to have significant but modest relationships with health-related behaviours (Adams and Mowen 2005). More specifically, in the exercise domain, previous research using the FFM has consistently identified extraversion to be significantly correlated with exercise behaviour (Courneya,
Bobick and Schinke 1999; Courneya and Hellsten 1998). Hence, it is not surprising that the present study found extraversion to have an effect on exercise behaviour.

One possible explanation for the consistent effect of extraversion on exercise participation could be the characteristic of this dimension itself. According to the Eysenck’s personality theory, individuals are assumed to behave in accordance with their personalities. Extraverts tend to actively seek out for excitement and sensory stimulation and this trait may lead them to activities such as sports and exercise (Rhodes and Courneya 2003a). Courneya and Hellsten (1998) found extraversion to be related to exercise motive of socialising or meeting people.

Hence, it is not surprising that extraverts are more inclined to participate in exercise activities because exercise can satisfy the social and relatedness need (Ingledew, Markland and Sheppard 2004). Indeed, extraverts are not only likely to seek active activities such as exercise, but also are more likely to adhere and maintain regular exercise (Rhodes, Courneya and Bobick 2001). The characteristics of extraverts seem to conceptually correspond with exercise participation and this perhaps provides explanation to the present results.

(e) Conscientiousness

Consistent with expectation and previous research, the present study found conscientiousness to be significantly and positively related to exercise intention and exercise behaviour. In structural model analysis, conscientiousness contributed to the prediction of both exercise intention and exercise behaviour. The effect of conscientiousness had on exercise behaviour was also mediated by exercise intention, but its direct effect was much greater than indirect effect. Importantly, conscientiousness was an important predictor of exercise intention, second only to attitude components. In the full structural model, conscientiousness had the strongest total effect on exercise
behaviour. Conscientiousness emerged as the most important construct in predicting exercise behaviour and its effects were greater than that of attitude, normative influences, and perceived control.

The social cognitive constructs contained in the present model were operationalised according to the ‘principle of compatibility’ as suggested by Ajzen (1991). That is, each construct is measured specific to each behavioural criterion, which involves target, action, context and time. Meanwhile, the personality measures (i.e., Big Five Inventory) used in the present study did not measure specifically to the behavioural criterion. Theoretically, the social cognitive constructs that measured according to this ‘principle of compatibility’ are expected to perform better (Ajzen 1991). Nevertheless, the total effect of conscientiousness on exercise behaviour is greater than any of the social cognitive constructs examined. One possible explanation for such results may be the temporal stability associated with personality traits (Rhodes, Courneya and Jones 2004).

The finding that conscientiousness had a stronger impact on exercise behaviour compared to social cognitive constructs is novel. This is because past studies that have examined the effects of TPB predictors and personality factors on exercise behaviour have reported greater social cognitive influence on exercise behaviour than personality factors (i.e., Courneya, Bobick and Schinke 1999; Rhodes and Courneya 2003a; Rhodes, Courneya and Jones 2004). This adds theoretical value to the health literature as conscientiousness may be an important factor in influencing other health behaviours as well.

The effect of conscientiousness on exercise participation makes theoretical sense. People with high conscientiousness tend to be determined, task-focused, achievement-oriented, persevering, and organised in carrying out tasks (John and Srivastava 1999). High conscientious people would be expected to be conscientious about their healthy living
such as exercise participation. The characteristics like discipline, achievement-oriented, and perseverance probably play an important role in stimulating exercise participation as well as maintaining exercise adherence. Therefore, it is not surprising for such strong effect conscientiousness had on exercise participation.

Overall, conscientiousness plays a significant role in predicting exercise behaviour. There are empirical evidences to support the importance of conscientiousness in predicting health behaviour (Booth-Kewley and Vickers 1994; Adams and Mowen 2005), linking this dimension to relaxation (Marks and Lutgendorf 1999), exercise motive (Courneya and Hellsten 1998) and more general exercise behaviour (Courneya, Bobick and Schinke 1999). It is concluded here that conscientiousness is relevant to exercise participation both conceptually and empirically.

(f) Openness to Experience

The role of openness to experience as a predictor of exercise behaviour for this sample is only partially consistent with expectation. Although openness to experience is found to be positively correlated with exercise intention and exercise behaviour, it did not predict exercise intention and exercise behaviour significantly. The present study also found openness to experience to have the weakest magnitude of observed correlation with both exercise intention and exercise behaviour compared to extraversion and conscientiousness. Previous results have produced mixed results regarding the link between openness to experience and health behaviour. The present finding is consistent with Booth-Kewley and Vickers’s (1994) study which failed to show significant association between openness to experience and several health behaviours such as wellness behaviour, accident control, and traffic risk taking.
There have been few reports of the relationships between openness to experience and health behaviours (Marks and Lutgendorf 1999). Specifically, many studies in the exercise domain did not include openness to experience in their studies (e.g., Schnurr, Vaillant and Vaillant 1990; Steptoe et al. 1994; Potgieter and Venter 1995; Yeung and Hemsley 1997a; Courneya, Bobick and Schinke 1999). This may suggest that openness to experience may be less relevant to healthy lifestyle behaviour such as exercising, both conceptually and empirically. Another possible explanation for the poor performance of openness to experience could be due to its poor measurement. This presumption is evident in the corrected item-total correlation analysis that found openness to experience scale to be relatively poor.

(g) **Exercise Intention**

Intention is viewed as one immediate antecedent of actual behaviour in the TPB model (Ajzen 1991). It simply means the stronger a person’s intentions to engage in a given behaviour or motivated to achieve their behavioural goals, the more likelihood they will do so. Meanwhile, there are also non-motivational factors such as availability of resources and opportunities that may affect actual behaviour. These factors represent individual’s actual control over performing the behaviour. Because it may be difficult to measure actual control, researchers are generally more interested in examining perceived control as its surrogate measure (Ajzen 1991). Collectively, a person’s perception of control and intention to perform a given behaviour will affect the actual performance of the behaviour (Ajzen and Driver 1992a).

Among other TPB predictors in the study, only exercise intention and perceived control had direct effect on exercise behaviour (Note: the effect of descriptive norm on exercise behaviour was too trivial to be interpreted here). Compared to perceived control, exercise intention had relatively stronger effect on exercise behaviour. The results of the present
study regarding the influence of perceived control and exercise intention on exercise behaviour seems to corroborate with past research. The direct link between exercise intention and exercise behaviour is well supported in the literature (Godin and Kok 1996). Specifically, there are numerous studies that support the positive links between exercise intention and behaviour in the exercise literature (e.g., Brickell, Chatzisarantis and Pretty 2006; Rhodes, Blanchard and Matheson 2006). Indeed, some studies have found behaviour intention to be the only predictor of actual behaviour (e.g., Symons Downs and Hausenblas 2003; Brickell, Chatzisarantis and Pretty 2006).

Notwithstanding the encouraging support for the links between intention and behaviour, there is still variability in the magnitude of relationship in terms of its correlations (Ajzen and Fishbein 2004). Relatively low bivariate correlations between intention and behaviour are sometimes found. For instance, low correlation between these two constructs are reported for online purchase behaviour (Pavlou and Fygenson 2006), low fat dieting (Povey et al. 2000), snacking behaviour (Grogan, Bell and Conner 1997), health protective behaviours (McCaul et al. 1993), and exercise (Saunders et al. 2004; De Bruijn et al 2006). In the present study, the magnitude of the relationship ($r = .591$) was considerably meaningful. This is probably due to the adherence to the ‘principle of compatibility’ whereby the intentions construct was operationalised as specific as the exercise behaviour in terms of the same TACT element (i.e., Target, Action, Context, and Time).

**8.3.4 Research Question 4: A Discussion**

*RQ4: Is there a mediating path of exercise intention that links social cognitive and personality constructs to exercise behaviour?*

Meta-analyses of the TPB found that most of the analyses considered only the direct antecedents of intention and behaviour, the possible mediating effects were not the
focus of these studies (Ajzen 1991; Godin and Kok 1996). The present study overcomes this limitation by examining the possible mediating role of exercise intention that links social cognitive and personality variables to exercise behaviour. In the full structural analysis, exercise intention was found to mediate the relationship between instrumental attitude, affective attitude, perceived control, conscientiousness and exercise behaviour. However, the indirect effects were too trivial compared to its direct effects.

The mediation path for attitude-intention-behaviour was significant. Nevertheless, the indirect effects attitude components had on exercise behaviour were too trivial to be interpreted here. The result implies that though both attitude components had a positive impact on subjects’ intention to exercise, it somehow did not translate into actual behaviour. Given the present empirical evidence that subjective norm components did not influence exercise behaviour through exercise intention, other alternative social factors ought to be considered when examining exercise behaviour. Indeed, the subjective norm components may be modelled as the antecedents of attitude components as the present study found subjective norm components to be significantly correlated with attitude components (Rhodes, Blanchard and Matheson 2006).

As discussed, the direct effect perceived control had on exercise behaviour is greater than its indirect effects, indicating that exercise participation is of neither the extreme end of complete volitional or non-volitional. Although the exercise participation decision is perceived to be very much up to individual, but there bound to be factors that restraint a person from participating in exercise activities. Qualitative approach in examining further the antecedents of perceived control may provide clear understanding of the control belief and perceived control factors.
In the present study, subjective norm components are found to be positively correlated with attitude components and exercise intention; attitude components are found to be positively related to exercise intention. It is therefore possible that subjective norm has its influence on exercise intention through attitude (Baron and Kenny 1986). Indeed, several studies have tested and confirmed this mediation link. For example, Hansen, Jensen and Solgaard (2004) found the indirect effect of subjective norm on intention to buy grocery online through attitude in both surveys to be larger than the direct effect of subjective norm on intention. The inclusion of path from subjective norm to attitude may improve the overall performance of subjective norm. Further research into this possibility is needed.

8.3.5 Research Question 5: A Discussion

RQ5: Can ‘high active’ exercisers and ‘low active’ exercisers be differentiated on the basis of personality and social cognitive factors?

The findings regarding this particular research question are encouraging. Overall, significant differences between ‘high active’ exercisers and ‘low active’ exercisers were found in terms of all personality and social cognitive factors studied. In predicting the exercise group membership, the current study found that conscientiousness and extraversion emerged to be the second and third most important factor in discriminating the two exercise groups, respectively, after taking into consideration exercise behaviour. Generally, the personality factor – openness to experience – appears to be substantially neglected in health research (Marshall et al 1994). The findings of the current study that regular and more active exercisers tended to be more open to experiences would certainly provide important insights into the potential role of openness to experience in health related behaviour. Additional analyses also revealed that age and occupation had different impacts on these two different exercise groups. This research finding is consistent with past studies that found age (e.g., Piazza, Conrad and Wilbur 2001; Netz
and Raviv 2004) and socioeconomic status (Grzywacz and Marks 2001) to be related to frequency of exercise participation.

8.4 Contributions and Implications of the Study

The present study has made several significant contributions. This section covers the main contributions of the study. The discussion will first cover the contributions to theory. This is followed by contributions to methodology, and lastly the contributions to practice. Implications for the study in terms of theory and practice will also be discussed.

8.4.1 Theoretical Contributions and Implications

For most academic research, a solid theoretical framework is needed to guide the research questions, research objectives and hypotheses development. The present study adds theoretical value to existing literature by developing and testing an integrative model of the TPB and FFM in predicting exercise behaviours. In-depth understanding of the motives behind the decision making, evaluations and behavioural aspects of individual exercise behaviour is expected to help the development of health-related marketing theory.

An extension of the TPB model to an area that has not been explored is considered an important step for the development of the theory (Ajzen 1991). The present study first contributes by applying theories and findings regarding exercise participation, which was developed based on literature in the West, to different cultural settings. Here, the integration of TPB and FFM to explore determinants of exercise behaviour is considered a new application. Overall, the results support the model efficacy and predictive ability of the integrative model of exercise behaviour. The integration of these two models can be used as a promising framework base to determine the antecedents of other healthy
lifestyle behaviours such as healthy eating, weight control, tobacco use and stress management.

Thus far, most studies of exercise behaviour are evaluated from the social psychology, medicine and health science perspective. No empirical study has thus far been conducted to investigate exercise behaviour from a consumer behaviour and/or marketing perspective. Theoretically, this study attempts to reduce the contention that the TPB has been neglected in the marketing discipline by exploring determinants of exercise behaviour and drawing marketing implications for health-related industries. The present empirically tested model contributes to the marketing literature by providing solid theoretical understanding of the exercise behaviour from consumer behaviour and/or marketing perspective.

Besides, this study also contributes by extending previous research in a number of ways. First, this study extends the TPB model with the addition of personality factors as determinants of an individual’s exercise behaviour after deliberate exploration and evaluations. Generally, the findings support the inclusion of personality into the modified TPB model. Specifically, the finding that conscientiousness has a stronger impact on exercise behaviour than social cognitive constructs is novel. This is because previous exercise studies thus far found the effects of social cognitive factors on exercise behaviour to be greater than personality dimension (Courneya, Bobick and Schinke 1999; Rhodes, Courneya and Jones 2004). The present study adds theoretical value to the health literature as conscientiousness appears to be a substantially neglected personality dimension (Marshall et al. 1994). Another key highlight of the study is that both extraversion and conscientiousness predicted exercise behaviour significantly, indicating the complementary nature of these two personality dimensions for understanding exercise participation (Courneya and
Hellsten 1998). Also, the finding that regular and more active exercisers tended to be more open to experiences certainly provides important insights into the potential role of openness to experience in health related behaviour.

Very limited research has examined the effects of personality and the TPB variables on a given behaviour. Previous studies that include personality factors into their modified TPB model have thus far either focused on how well the TPB predictors and personality factors predict exercise behaviour (Courneya, Bobick and Schinke 1999) or examine the moderating role of personality factors within the TPB framework (Rhodes, Courneya and Jones 2005). In a meta-analysis of TPB in health domain, Godin and Kok (1996) found that most of the TPB studies have considered merely the direct antecedents of intention and behaviour. It is evident in the literature that less effort has been produced to test the mediating effects of exercise intention empirically. Indeed, no study has thus far provided such robust empirical approach to test the mediating role of exercise intention within the framework of TPB and FFM using the SEM technique.

Research addressing whether distinct exercise groups (i.e., ‘high active’ exercisers and ‘low active’ exercisers) can be differentiated on the basis of social, personal, and psychological factors has been limited. Specifically, no empirical study has examined the predictive power of social cognitive and personality factors simultaneously in discriminating exercise groups. The present findings are very encouraging whereby significant differences are found between ‘high active’ and ‘low active’ exercise groups in terms of all social cognitive and personality characteristics studied. It can be concluded that different exercise groups may behave differently when it comes to purchase and consumption of certain products and services. The present findings provide great marketing insights to marketers involved in health-related businesses targeting at healthy lifestyle segment.
The majority of TPB studies have focused on the key links between variables. Demographic differences in the TPB measures have been largely neglected. The current researcher has found only one relevant study (i.e., Nigg, Lippke and Maddock 2008) which examines whether the TPB framework operates equivalently across gender, age, and ethnic groups using a random sampling method (n = 3533). However, other important socio-economic variables such as income, education and occupation were not examined in the study of Nigg, Lippke and Maddock (2008). Also, Nigg, Lippke and Maddock’s (2008) study was based on student samples, and hence the results cannot be generalised to larger population (Hagger et al. 2007). Although there have been relatively more research relating to demographic differences in personality factors, these studies have been much dominated in the United States. To date, no empirical exercise study has provided such comprehensive analyses of the demographic differences in both the TPB and personality constructs. Hence, the present study certainly contributes significantly to the existing body of knowledge.

Further, most studies that apply TPB model include only behavioural intentions construct and not the actual behaviour (Godin and Kok 1996). However, the fact is that individuals who intended to exercise may not actually do so eventually. Also, there are still limited research attempt to answer whether the relationships between social cognitive constructs, personality factors and exercise behaviour are direct or possibly indirect through exercise intention. In this instance, the present study adds further value to literature by incorporating exercise behaviour as an ultimate dependent construct into the model.

8.4.2 Methodological Contributions and Implications

As discussed in the earlier chapter, the main TPB measurement issues centre on the efficacy of a single concept TPB structure compared to a disaggregated two-factor measure. The present study contributes by clarifying the best operational construction of
the social cognitive constructs contained in the TPB in order to better understand its influence on exercise behaviour. Here, the efficacy of a single TPB measure in comparison to disaggregated multi-components TPB structure was tested using structural equation modelling technique. Indeed, not many studies have conducted such alternative models testing. As expected, the present findings confirm the conceptual distinctions between both attitude and subjective norm components. The disaggregated attitude and subjective norm components achieved better model fit. Hence, it is recommended that future research should consider the disaggregated multi-components structure of attitude and subjective norm.

The operationalisation of PBC concept is controversial and researchers have failed to reach a consensus about the definition of control factor. The present findings conclude that the PBC construct is best retained as a single perceived control concept which captures merely the perceived control measure. The inconsistencies and disparities in PBC measurement suggest that further empirical findings needed to minimise measurement redundancy as well as improving the efficacy of the model.

The empirical findings of the present study also offer implications for consumer researchers. First, the poor performance of subjective norm components may partly be attributable to the lack of clarity in the construct measurements. For example, the term ‘people who are important to me’ used in the instrument did not indicate the source of reference (e.g., parents, peers, or siblings). The types of social influence (e.g., stimulation from others, or support in the form of resources) as well as the nature of influence (support or not support exercise participation) were also not stated clearly (Saunders et al. 2004). Such measurement details should be given attention in developing better measurements for normative influence.
An integrative model of FFM and TPB was empirically tested. The relationships among personality, social cognitions, and exercise behaviour were addressed, justified and empirically tested simultaneously using SEM. The use of SEM enhances the statistical efficiency of the present finding in a number of ways. First, it enables the analyses of multiple structural relationships simultaneously that result in more accurate modelling than merely the SPSS application (Hair et al. 2006). The SEM technique allows alternative model testing to compare the efficacy of a single TPB measure versus the disaggregated multi-components structure. Third, the direct and indirect effects of all the predictors in the study have on exercise intention and behaviour can be estimated easily at once. Lastly, the measurement error problem associated with the mediating effects testing can be minimised with the use of SEM (Baron and Kenny 1986). This is because SEM technique provides explicit estimates of the measurement errors and hence considered to be a more superior approach (Byrne 2001).

Past research that examined the dimensionality of the five personality factors have relied on personality scales other than the Big Five Inventory (BFI, John, Donahue and Kentle 1991). The present researcher found only two studies (i.e., Benet and Waller 1995; Worrell and Cross 2004) that have examined the structural validity of the BFI. The present study is the first to assess the structural validity of the BFI in a Malaysian sample. This study has only identified three factors associated with personality dimension in the factor analysis, with conscientiousness emerging first and accounted for the largest proportion of variances. This is incongruent with the past research which yielded five factors (i.e., Benet and Waller 1995) or six factors (i.e., Worrell and Cross 2004) in their factor analyses. The finding inconsistencies may be due to cultural differences as both Benet and Waller’s (1995) and Worrell and Cross’s (2004) studies were conducted in the West using different samples. There is a need to replicate the present study in order to provide a meaningful base for comparison.
While Courneya, Bobick and Schinke (1999) and Rhodes and Courneya (2003a) included personality factors into their modified TPB model, they focused on investigating the relationships between the main constructs. The overall testing of construct validity for their TPB and personality measurement was not examined in their studies. Methodologically, the present study contributes by demonstrating strong support for satisfactory convergent validity and discriminant validity for the TPB and personality scale.

It is observed from the literature that most exercise researchers have used undergraduate students as their sample and have focused very much on youth and adolescent. One sampling problem associated with such a relatively homogenous group is that the results may not be generalisable to the larger population (Hagger et al. 2007). The present study was carried out in Malaysia using general adult population as respondents. It is speculated that adults as opposed to adolescent will be able to provide more accurate, realistic and stable view points. This also contributes to the existing body of knowledge by examining the robustness of the proposed integrative model in its ability to predict exercise behaviour with a different sample.

8.4.3 Practical Contributions and Implications

Other than theoretical contributions, this study may have significant practical contributions and implications. In today’s fast-paced and increasingly competitive market, the bottom line of a firm’s marketing strategies and tactics in the profit organisation is making profit and contribute to the growth of the company. The integrative model of FFM and TPB model will help marketers in the health-related industry to gain a better understanding of the personal, social and psychological factors that influence individual’s exercise participation. Armed with this knowledge, marketing
practitioners could plan and execute their marketing strategies particularly segmentation, positioning, merchandising and communication more effectively.

The pressure of escalating costs of public health care has been a major concern for people and the government. Many governments are actively promoting public healthy lifestyle behaviour as it is crucial in reducing both health risks and medical costs. The present model of the study describes a concrete set of socio-demographic and psychological factors that public policy officials and health professionals might manipulate to facilitate health promotion. Based on this integrative model, public policy agents can design effective interventions and strategies to improve public attitudes, heighten social pressure and enhance control factors over healthy lifestyle activities.

The present study offers substantial insights to marketing practitioners and public policy makers interested in persuading general population to adopt healthier lifestyle. Marketing practitioners from such diverse industries as healthcare, fitness centres, advertising and marketing communications, insurance, retail businesses as well as organisations who are interested to pursue agenda of wellness would benefit from the empirical findings. Several suggestions on how theory could be put into practice are summarised in the following paragraphs.

Identification of the various factors that affect individual exercise participation is necessary. This empirically tested model of exercise behaviour provides guidance for marketers to target at selected social cognitive and personality factors which are keys to influencing exercise behaviour. Several factors such as attitude (both instrumental and affective aspects), perceived control and certain dimensions of personality (especially conscientiousness and extraversion) should be considered when addressing marketing strategies and tactics. For instance, fitness centre operators should employ a multifaceted approach that take into account such factors in their marketing planning and execution.
tasks. A clear understanding as to the direction and sequence of relationships between these social cognitive and personality factors can help ensure better targeting of limited marketing resources. In view of the rising advertising and promotion costs, effective tailored messages that aim at promoting exercise participation could help in optimising limited budgets and resources.

From the present findings, attitude contributes the most to the prediction of intention to exercise. The practical implication here is that interventions strategies targeting attitude would certainly improve individual exercise intentions and subsequent behaviour. More specifically, affective attitude had greater impact on exercise intention compared to instrumental attitude. It is observed that most of the current exercise activity interventions and promotion strategies rely heavily on persuading individuals about the benefits of exercise, a technique that focuses primarily on instrumental attitude.

Based on the present findings, however, the assumption that one will exercise just because he or she becomes aware of the health benefits may not be sufficient to promote behavioural change. Affective attitude-based interventions are warranted if these findings are to be applied to exercise participation promotion effort. Changing the affective aspect of attitude may pose a greater challenge as it involves creating positive experiences (e.g., excitement and enjoyment) associated with exercising rather than persuasion through providing factual information about the benefits of exercise. For instance, fitness clubs operators may use trial period, various promotion efforts to entice customers to try their services and experience the fun and enjoyment of exercising at their fitness centre.

The strength of perceived control factors in motivating individual exercise behaviours may have marketing implications in that perceived opportunities and resources influence people’s decision to change their exercise behaviour. Although the present study did not
attempt to investigate the antecedents of perceived control, time constraint has been quoted in the exercise literature as the most frequently reported barrier for participating in exercise activity (Mohd Nordin et al. 2003). Hence, interventions aimed at improving time management may be an important avenue for exercise promotion. Specifically, for health and fitness clubs business, perceived price (i.e., membership fees) and availability (i.e., convenience) may become a potential impediment to action. Clearly, the marketing implication here is related to price and distribution strategies. Further research into the factors underlying the perception of opportunities and resources would certainly be beneficial to marketers and public policy makers.

As predicted in the original TPB model, the present study found all the social cognitive constructs to be significant and positively correlated with one another. The high correlations between attitude components and subjective norm components reported in the present study supported the interdependency of the two constructs. That is, the greater the perceived social pressures, the more favourable the attitude towards exercising. Marketers and advertisers have known to rely on potential reference group influence on consumer behaviour in the development of their advertising and promotion programmes. The reference group influences, in turn, may contribute to the formation of attitude. Consequently, any intervention aims at cultivating social influence toward exercise is likely to enhance the perceived favourability towards exercise participation. The practical implications of this finding are that social factor interventions may be used to influence consumer attitude positively.

Marketing researchers are generally interested in predicting future behaviour as accurately as possible so as to optimise their planning and execution efforts. Personality is a relatively more stable predictors of behaviour compared to social cognitive factors. Consequently, a practical implication of this research may be that personality needs to be
considered along with social cognitive influences when developing exercise intervention. For instance, advertising messages aimed at improving the efficacy of exercise promotion may be tailored based on characteristics like personality traits. Since extraversion and conscientiousness have been identified as predictive of exercise behaviour, communication messages designed to promote these traits could be effective for inducing exercise behaviour.

Further, the application of discriminant analysis reveals that personality variables (i.e., conscientiousness and extraversion) are among the most important factors in discriminating between ‘high active’ and ‘low active’ exercise groups. Generally, ‘high active’ exercisers are more extraverts, more conscientious and more open to new experiences. This has important implications for advertisers and marketers targeting this segment especially for their marketing communication efforts. Appropriate advertising messages and media selection could be planned to make their advertisement more appealing to such segment. Beside, the findings also have implication for sports marketing. Individuals are likely to participate in sports or events that reflect their personality. Hence, sports event organisers must ensure the sports activities fit the personality types of their target market and vice versa in order to make marketing strategies appealing.

The present study demonstrated significant differences between ‘high active’ and ‘low active’ exercise groups in terms of social cognitive and personality characteristics. Generally, this implies that different exercise groups may behave differently when it comes to purchase and consumption of certain products and services. Those manufacturers or vendors who supply health-related products and services that appeal to the healthy lifestyle segment need to consider the differences between these sub-
segments in order to make better decision as to how best in utilising marketing budgets for advertising, personal selling efforts, and other promotion activities.

The choices made by individual concerning exercise and fitness activities are a form of consumer behaviour. In the marketing perspective, consumers adopting a healthy lifestyle can be viewed as a specific market segment. Understanding social cognitive profile of the two exercise groups is important. Armed with this knowledge, marketers can segment the market according to these characteristics. For instance, based on such information, health care marketers are in a much better position for market planning and development of current or new offerings, and development of appropriate communication strategies. Food manufacturers and retailers could also use such information to determine the appropriateness of product, distribution, and promotional strategies that target at these segments.

This study revealed that ‘high active’ exercisers tended to have more positive attitude towards healthy activities like exercise. As exercise is an important component of healthy lifestyle behaviours, this implies that the ‘high active’ groups may potentially be health conscious consumer segment. In this instance, health care service providers that traditionally focused on ill consumers may consider a new market for their wellness programme or other health promotion products or services. This market segment could be targeted by determining the purchasing behavioural characteristics, shopping and media habits of individuals who have favourable attitude towards adopting healthy lifestyle.

Simply applying a common marketing approach to all customers without looking at customer characteristics can be disastrous. The present study found selected demographic variables such as gender, age, and education to have association with certain social cognitive, personality, and behavioural factors. Knowing whether the
different demographic groupings exhibit different responses on the social cognitive and personality factors as well as exercise behaviour could have considerable marketing implications. For instance, the lower score of female with respect to their attitude, exercise intention and behaviour might be due to the busy schedules that many working women have in managing their full-time work, childcare, and housekeeping responsibilities. This type of information could help marketers in identifying market segments that have the highest potential; determining positioning strategies that best matched the target market selected; and developing appropriate marketing programme that support the positioning.

Demographically, this study found that age and occupation are more important variables than gender, race, religion, martial status, and education background in delineating whether an individual is going to be highly active or less active in exercise participation. This has strong implications to marketing practitioners especially those involved in health-related industries. For instance, health club and various fitness programmes operators can rely on these characteristics to influence customers to join their club membership. Marketing strategies and tactics need to be adapted to reach different demographic groups of exercisers. The health and fitness market in Malaysia is becoming more competitive. Marketers need to embrace innovative marketing strategies and findings ways to differentiate themselves in the competitive market. Good understanding of relevant target market characteristics is crucial for subsequent positioning strategies planning that could help to distinguish their brand and services from competitors’ ones. Demographic findings are also crucial to sports marketing in identifying consumers who are most likely to attend sports event and /or use certain types of products or services.
Gaining long-term, effective and consistent behavioural change aimed at increasing public’s healthy lifestyle behaviour is a very challenging task for both marketing practitioners and public policy makers. It is hoped that the present model delineates a concrete set of factors that marketers and public policy officials might manipulate to facilitate healthy lifestyle promotion. 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 present study provides a base for future research on not just exercise participation, but also extended to other healthy lifestyle behaviours.

8.5 Limitations of the study

Despite the claim that the present study has made a number of contributions to the literature and practice and has achieved all the stated research objectives adequately and appropriately, it is inevitably subject to limitations. There were several limitations encountered during the implementation of the study which should be considered when interpreting the results of this study.

**Limitation 1:** The current study employed a cross-sectional design that assessed exercise intention and behaviour concurrently in the same set of questionnaire. Theoretically speaking, the present study did not adhere to the logically time interval required by the TPB. Hence, the analysis of causal relationships for the TPB constructs was not possible. This time interval can be fulfilled by adopting a longitudinal study design whereby the measures of predictors and intention will be collected at Time 1, whereas behaviour will then be assessed later (Time 2). However, the fact remain that the longer the time interval between the measurement of intention and actual performance of behaviour, the more unforeseen circumstances that may affect the behavioural outcome (Ajzen and Fishbein 2004). To overcome this problem, some exercise researchers opt for a 2-week
follow up measures of exercise behaviour (e.g., Rhodes, Jones and Courneya 2002; Hagger and Chatzisarantis 2005; Kraft et al. 2005; Rhodes and Courneya 2005; Rhodes, Blanchard and Matheson 2006). But, one may wonder how much changes and differences it can be for a 2 weeks time interval. Realistically, the cross-sectional approach is preferred given the difficulty of having to re-contact the subjects at Time 2. Additionally, exercise can be considered a habitual activity and considerable stable behaviour (Rhodes and Courneya 2003a; de Bruijn et al. 2006). The cross-sectional design is quite common in TPB research (see Armitage and Conner 2001).

**Limitation 2:** The second limitation involves the use of self-report survey measures. The data analysis was restricted to such subjective measure of exercise behaviour, rather than collecting the actual exercise behaviour using objective measures (e.g., aerobics class attendance or fitness activity monitoring). Although subjects were assured of anonymity and confidentiality, potential social desirability may have artificially inflated the observed relationship. Also, there is a concern regarding common method variance when interpret the correlations between measures derived from a single-source self-report data (Summers 2001). However, most researchers adopting Ajzen’s model still rely largely on self-report data. In the exercise domain, self-report is considered the most common and practical approach for its consistent reliability and validity (see Godin and Shephard 1985; Godin, Jobin and Bouillon 1986). The objective measures of exercise behaviour are not pragmatic for such large sample. The present study opted for self-report measure as it is less costly and easily administered, and they have been shown to be reliable and valid approach for collecting information regarding exercise behaviour (Sylvia-Bobiak and Caldwell 2006).
**Limitation 3:** One caveat, noted in the measurement section, is the personality scale (i.e., Big Five Inventory, BFI) used to measure the five personality factors in the present study. While the BFI is a psychometrically sound measure of personality factors (John and Srivastava 1999), the present study found reliability and validity problem associated particularly with the agreeableness and neuroticism factor. This may due to the different cultural setting of the present sample. Subsequently, these two personality factors were removed from further analysis. Even though the reliability and validity for those remaining personality factors is satisfactory, the study could have been benefited more if agreeableness and neuroticism were found to be reliable and valid measures.

**Limitation 4:** Next, the exercise behaviour construct was measured with a singular form of scaling. Although SEM technique was utilised to estimate the concepts free of measurement error, there is still some system variance errors associated with a singular form of scaling (Rhodes, Blanchard and Matheson 2006). Still, this is a common practice in the exercise domain whereby numerous researchers (e.g., Rhodes, Jones and Courneya 2002; Rhodes and Courneya 2003b; Rhodes, Courneya and Jones 2004) overcome this problem by fixing a priori error estimates on single indicator and place theoretical constraint within the model (Hayduk 1996).

**Limitation 5:** This study did not focus on examining the antecedents of attitudes, subjective norm and perceived control. The inclusion of the behavioural, normative, and control beliefs as delineated in the TPB model would have produced greater understanding of the determinants that influence these social cognitive components. It would have provided more precise information that is important to the development of a marketing and health promotion strategy.
**Limitation 6:** Although the proposed integrated model of exercise behaviour have been supported with greater variance explained in the full structural model compared to previous research, there is still some proportions of the variance left unexplained. Perhaps there are other important factors that might influence exercise behaviour but these factors are not addressed in the present model.

**Limitation 7:** The last limitation concerns the methodology adopted in the present study. First, this study focused on a specific group (i.e., subjects who exercise at least once a week in the last 3 months). Hence, comparison can not be made with those who do not exercise at all. Second, though the sample size is large, this study was based on a sample from Klang Valley areas given that exercise is an urban phenomenon. Third, as the participation in the study was voluntary, subjects may be more health conscious and tend to be better educated and knowledgeable. Although careful consideration has been given in the quota set, the generalisability of the findings to a wider population should be done with caution.

### 8.6 Suggestions for Future Research

Current research on determinants of individual exercise behaviour suggested a number of areas for concern, point to several avenues for further research.

First, in light of the limitations of cross-sectional approach, it is suggested that future research should replicate the study using a longitudinal approach to fully test the theory and analyse the causal links between the variables in the model.

The second suggestion for future research concerns the issues of self-report survey measures and singular form of scaling for exercise behaviour measure. Future research
may consider more objective measures such as fitness class attendance or activity monitoring as well as multiple indicators to measure exercise behaviour.

Third, in relation to those personality measures with poor reliability and validity, further refinements and validation of the personality scale is necessary to adapt the scale to local cultural settings. Further, the present study only examined the five major factors of personality. More specific examination into the individual facets of each factor such as NEO-FFI (Costa and McCrae 1985) may enhance the prediction of exercise behaviour. Other possible research idea may be the inclusion of a more narrowly defined personality factor such as locus of control, self-motivation, and self-esteem.

Fourth, while there is a good reason for a predominantly quantitative study like the current one, future study may consider quantitative approach in conjunction with more qualitative approach. Qualitative method may be conducted to explore the antecedents of attitude, subjective norm, and perceived control so that more in-depth insights could be obtained in understanding these social cognitive measures.

Fifth, the inclusion of moderating variables will contribute to important theory development (Baron and Kenny 1986). Specifically, Rhodes, Courneya and Jones (2005, p. 253) argued that “identifying the underlying causes of TPB differences in the form of moderators is an important theoretical and applied undertaking”. Gender has often been identified as a key moderator in consumer behaviour studies (Nysveen, Pedersen and Thorbjørnsen 2005). It was observed in this study that gender had an association with both exercise intention and behaviour with male consistently demonstrated greater exercise intention and exercise frequency. Hence, it is speculated that gender may be a potential moderator for the link between exercise intention and behaviour. Identifying such moderating effect is important for better marketing communications strategies to
gender segments and for better understanding the different motives underlying exercise participation between male and female.

Sixth, 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, this study primarily focused on the prediction of exercise behaviour. 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 encouraged to explore more comprehensive aspects 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. Indeed, a number of other variables such as involvement may affect the strength of the links between variables. Future research needs to examine this issue more closely and perhaps validate the final model using the cross-validation sample technique with a different sample to improve the generalisability of the model.