*Ann Appl Sport Sci,* InPress(InPress): e1281.
http://www.aassjournal.com; e-ISSN: 2322–4479; p-ISSN: 2476–4981. 10.61186/aassjournal.1281

**ORIGINAL ARTICLE**

# Psychometrics' Properties of Sports Commitment Questionnaire-2 among Racquet Sports Athletes in Malaysia

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**Submitted October 31, 2023; Accepted in final form January 06, 2024.**

## ABSTRACT

**Background.** Sports psychologists believe sports commitment is important to indicate the desire to continue or cease participation in sports from a psychosocial perspective. The Sports Commitment Questionnaire-2 (SCQ-2) has been developed and validated to investigate athletes' commitment in sports settings in Western countries but not in Malaysia. Hence, it is essential to establish instrument validity before being widely used in Malaysia, especially among athletes. **Objectives**. This study aimed to evaluate the psychometric properties of the Sports Commitment Questionnaire-2 (SCQ-2) among Malaysian racquet sports athletes. **Methods.** This is a cross-sectional study, a total of 416 players (245 males/ 171 females, μ age=29.94±11.47) completed the SCQ-2 (Scanlan et al., 2016) consisting of 58 items measuring ten factors and two dimensions of sports commitment. We examined the psychometric properties of SCQ-2, by conducting Confirmatory Factor Analysis and examined discriminant validity and composite reliability (CR). **Results.** Initial fit indices of the hypothesized measurement model did not achieve satisfactory fit. But, after further model modification i.e., deleting 3 items resulted in good data fit (CFI=0.90, RMSEA=0.05, TLI=0.90, $X^2/df$=2.14). Discriminant validity also met the suggested cutoff value (< 0.90). whereas CR values were acceptable for the subscales ranging from 0.77 to 0.89. Convergent validity (AVE, ranging from 0.50 to 0.58) and discriminant validity (<0.90) were also established. **Conclusion.** The SCQ-2 showed adequate validity and reliability which enable sports practitioners to access athletes' commitment in a sports context.

**KEYWORDS:** ***Constrained Commitment, Enthusiastic Commitment, Racquets Sports Athletes, Sports Commitment Model, Sports Enjoyment.***

## INTRODUCTION

Sports psychologists believe sports commitment is important in determining the desire to continue or cease participation in sports from a psychosocial perspective (1). The Sports Commitment Model (SCM) is now the most used model to explain why athletes continue playing their sports. The original framework of the SCM was developed by Scanlan et al. (1993) (1). However, SCM has recently been reviewed, modified, and expanded as reported in studies of Hungarian and Spanish sporting populations (2, 3).

The revised SCM (4) consists of two dimensions of commitment, which are enthusiastic and constrained commitment. The former refers to self-willingness to continue to

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participate in sports by overcoming difficulties or obstacles whereas the latter refers to the feeling of forced, trapped, and obligated participation in sports (1). In addition, the revised SCM now consists of ten sources/ factors. influencing sports commitment i.e., sports enjoyment (feeling fun an pleasure during sports participation), valuable opportunities (gains through continues sports participation like skill mastery, friendship), other priorities (activities which attract or cause withdrawal from sports participation), personal investment-loss (resources put in to play sports which one cannot recover following sports withdrawal), personal investment-quantity (the amount of resources that athletes channeled into their respective sports), social constraints (social expectation to play or not play sports), social support-emotional (support, encouragement from significant others, coaches, teammates to continue participation in sports), social support-instrumental (useful information, guidance or advices given to the athletes), desire to excel-mastery achievement (achieve goals like winning or improving skills) and desire to excel-social achievement (through establishing superiority e.g., winning over opponents) (4).

Recent studies using the revised SCM to examine the factors predicting sports commitment in various sports across countries revealed that the majority of athletes are committed to sports due to sports enjoyment. For example, a study of US soccer players (5, 6), junior tennis players (7), recreational tennis players (8), and young female gymnasts (9) reported that enjoyment was the main predictor of sports commitment. Similarly, Casper et al., (2007) (10) found that both enjoyment and personal investment were the main predictors in sports commitment across US tennis players. The important role of enjoyment in sports commitment is evidenced in Thai athletes (11) and also master (veteran) swimmers from 37 countries (12). While Greek athletes reported involvement opportunities were the main factor predicting sports commitment (13). In line with this, studies on US high-school and collegiate athletes (14) and older ballroom dancers (15) also found that involvement opportunities encourage athletes to remain in their respective sports.

In the past two decades, only a few sports commitment studies have focused on the role of gender. The results of studies on US recreational adult tennis players (8) and Canadian student-athletes did not show any significant differences in sports commitment between genders. However, the study on masters/ veteran swimmers reported that male swimmers showed greater enthusiastic commitment and greater personal investment as compared to female master swimmers (12). Both male and female swimmers reported sports enjoyment as the most important factor in relation to sports commitment (12). Since there are limited studies (3 studies) currently that evaluated this topic further research is needed to truly understand the role of gender on sports commitment especially in different types of sports and cultural backgrounds.

While only two studies explored the role of age groups on sports commitment. Both studies Casper et al., (2008) and Wang et al., (2016) reported that older athletes were more committed to sports in relation to younger groups (8, 15). In addition, Weiss (2015) showed that collegiate athletes (aged between 18 to 24) reported higher levels of investment, costs, involvement opportunities, perceived competence, social support, and performance motivational climate compared to high school athletes (aged 14-17) (14). On the other hand, high school athletes reported higher levels of social constraint and mastery-motivational climate as predictors of sports commitment. However, it must be noted that most of these studies were conducted in the US hence the question remains if studies in other countries might reveal different outcomes due to cultural, religious beliefs, and socioeconomic differences.

In recent studies, the Sports Commitment Model of five-factor was tested using structural equation modelling (1). The study reported adequate data fit (CFI=0.98, R2=0.68, standardized residuals between 0.03 and -0.13). However, Weiss et al. (2001) suggested that enjoyment should be the mediating variable to sports commitment because personal investment and alternatives were strongly correlated to enjoyment (7). The mediational model proposed by Weiss et al. (2001) provides good fit indices (CFI=0.91, RMSEA=0.07, R2 enjoyment=57.7, R2 commitment=91.7) (7). Despite agreeing with Weiss et al. (2001), both Chairat et al. (2000) and Casper et al. (2007) rejected the mediation model as the original model showed better-fit indices as they claimed all the factors in sports commitment model were equally important in relation to sports commitment (10, 11).

Although there have been differences in terms of predictors for sports commitment across different countries the issue of ethnicity has never clearly been examined to date except in Hungary and Spain (2, 3). Similarly, the psychometric properties of the Sports Commitment Questionnaire-2 (SCQ-2) in different populations have not been investigated to date across the globe, especially in Asia. The initial SCQ-2 was written in English and has been validated (Satorrae Bentler scaled x2 (1530)=3327, p<0.001, NNFI=0.89, CFI=0.90, SRMR=0.04, RMSEA=0.04) in the US (4). In this study, types of commitment (i.e. enthusiastic and constraint commitment) together with a few factors (i.e. personal investment-loss, personal investment-quantity, social support-informational, social support-emotional, desire to excel-mastery achievement and desire to excel-social achievement) were added to Sports Commitment Model. Scanlan et al. (2016) suggested that this questionnaire should be generalized to various sports and across different competitive level (4). They also recommend that SCQ-2 is suitable only for adult athletes because several items in the scale were too complex for younger athletes. In line with that, the samples of this study were above 18 years old.

SCQ-2 was then adapted into Spanish by Sanchez-Miguel et al. (2019) (x2 (1711)=3188, p<0.001; CFI=0.91; TLI=0.90; Incremental Fit Index (IFI)=0.91; SMRM=0.05; RMSEA [90% CI]=0.04) and Hungarian by Berki, Piko and Page (2020) (x2 (708)=1177, p<0.001; CFI=0.92; TLI=0.91; SRMR=0.05; RMSEA [90% CI]=0.04) (2, 3). Sanchez-Minguel and colleagues (2019) recommended generalizing the scale to various sports and further examining the validity of the constructs of sports commitment (3). Berki and colleagues (2020) suggested the sample should reduce gender inequivalence (2). Second, they also recommended future studies to examine the internal consistency between the constructs (2, 3). Generally, both Spanish and Hungarian versions of SCQ-2 showed acceptable construct validity and reliability which enable sports practitioners to use SCQ-2 to assess athletes' commitment and to prevent dropout.

However, to date, SCQ-2 has never been validated in the Southeast Asian population, especially among racquet sports players across the globe. Therefore, we aimed to validate SCQ-2 in the Malaysian population.

## MATERIALS AND METHODS

**Participants.** Samples were randomly selected from all the states in Malaysia which include West and East Malaysia. A total of 416 athletes (245 males, 171 females) comprising 100 badminton players, 105 table tennis players, 108 tennis players, and 103 squash players, with ages ranging from 18 – 60 years (μ=29.9±11.5 years) were recruited. The sample size was in the range of 200-500 participants recommended for CFA analysis (16, 17, 18).

**Procedures.** The permission to conduct this study was obtained from the University of Malaya Ethic Board (UM. TCN2/RCH&E/UMREC-14). Participants are Malaysian athletes who participated in racquet sports (i.e. badminton, table tennis, tennis, and squash). The participants have at least represented either state or Malaysia in the tournament. The participants were recruited from states' sports bodies for example state lawn tennis association and state badminton associations prior to getting permission from the administrator. The study uses simple random sampling based on the name lists given by the states' sports associations. The inclusion criteria for the participants are at least one state player who took part in national, interstate championship, and other higher-level tournaments. Prior to participation, the nature of this study was clearly explained to all participants. Participation was on a voluntary basis and participants can withdraw at any time and without any consequences. All participants provided their signed written consent and then completed the Sports Commitment Questionnaire-2 in physical copies. On average, participants took 15 minutes to complete the questionnaire. The questionnaire was then returned to the researchers. The confidentiality of the participants was secured as there was no identifier marker to trace their identity. The collected data were kept in a locked steel cabinet. Access to the data is only available to the researchers of this study.

**Instrument.** The Sports Commitment Questionnaire-2 was used to measure athletes' commitment among Malaysian racquet sports athletes. Although the study was conducted in Malaysia, the version used in the study was in English because Malaysia uses the UK education system from primary to tertiary education. SCQ-2 was developed based on two dimensions of commitment and ten sources of commitment. The

two dimensions of commitment are enthusiastic commitment (6 items) and constrained commitment (5 items). The ten sources were Sports Enjoyment (5 items), Other Priorities (5 items), Personal Investments-Loss (5 items), Personal Investments-Quantity (4 items), Social Constraints (4 items), Valuable Opportunities (4 items), Social Support-Emotional (4 items), Social Support-Informational (5 items), Desire to Excel-Mastery achievement (6 items) and Desire to Excel-Social achievement (5 items). In total, the SCQ-2 has 58 items which are scored on a Likert scale from 1= Strongly Disagree to 5= Strongly Agree. SCQ-2 has previously been validated by Scanlan and colleagues (2016) (4).

**Data Analysis.** A pilot study was conducted prior to the main study to check for its cultural suitability targeted at the Malaysian population. The reliability score for the pilot study of 40 participants ranged from 0.83 to 0.91 indicating its suitability.

Subsequently, for the main study, the SCQ-2 was distributed to participants (n=416) from state sports associations across Malaysia. Prior to performing Confirmatory Factor Analysis (CFA), all items were checked for missing values and normality using IBM SPSS version 23.0. The recommended values of skewness and kurtosis should not exceed 2 and 7 respectively (19). The skewness scores were below 2 (ranges from 0.00 to 1.48), and kurtosis was all below 7 (ranges from 0.01 to 2.40) which indicates the data were normally distributed. Subsequently, IBM AMOS 23.0 software using maximum likelihood (ML) was used to perform CFA in order to assess model fit after complying with multivariate normality (20). To access model fitness, Hair et al. (2010) suggested at least four fit indexes to determine the good fit of a measurement model (21). The guidelines for fit indices for this study were the Chi-Square/degree of freedom (Chisq/df) with a value of <3 seen as a good fit, Goodness of Fit Index (GFI) which should be greater than 0.90, Comparative Fit Index (CFI) and TLI which should be greater than 0.90 (18), and Root Mean Square of Error Approximation (RMSEA) less than 0.08 and P of close fit (Pclose) greater than 0.05 (22, 23) considered to indicate an acceptable fit. The recommended factor loading with 0.60 and above is appropriate (21). Discriminant validity was obtained with the guideline of r values less than 0.90 (24) and convergent validity was obtained using AVE. Lastly, construct reliability was obtained using Raykov's method where the cutoff value should be greater than 0.60 (25).

## RESULTS

**Confirmatory Factor Analysis of SCQ-2.** Based on Structural Equation Modeling (SEM), the initial result in Figure 1 showed that most of the items' factor loading was above 0.60 except for three items which are Item 1, Item 2, and Item 31. The data fit was not ideal at the initial SEM (CFI=0.88, RMSEA=0.05, TLI=0.87, $X^2$/df=2.22 Chi-square=3398.74, P-close=0.00). Based on the modification indices provided by AMOS stepwise improvements were performed to the model. This included the deletion of items and allowing error terms to co-vary within factors (i.e., Item 1, Item 2, and Item 31). Though these items were dropped, the number of items remaining in each subscale is at least three items which are sufficient to constitute a subscale. Our consideration is based on Costello and Osborne (2005) who suggested that subscales with fewer than three items are generally weak and unstable (26).

To improve on the data fit, covariance between items within subscales was also established. These includes covariance between e5 and e44, e15 and e18, e3 and e9, e32 and e39, e21 and e39, and e26 and e9. The final data fit was acceptable CFI=0.90, RMSEA=0.05, TLI=0.90, $X^2$/df=2.14 Chi-square=2906.59, P-close=0.07 (see Figure 2). The model of this study complied with the original framework of the sports commitment model. There were ten factors and two dimensions of sports commitment in the final model analysis without dropping any factors.

**Discriminant validity, convergent validity, and reliability of SCQ-2.** Discriminant validity shows evidence of the extent to which a given construct differs from other constructs (27). In other words, constructs should not be highly correlated with each other. The Heterotrait-monotrait ratio of correlations (HTMT) technique was utilized to assess the discriminant validity between constructs. The discriminant validity is established if the HTMT value is below 0.90 (24). Table 1 shows the HTMT ratio between variables are all below 0.90 indicating discriminant validity is established.

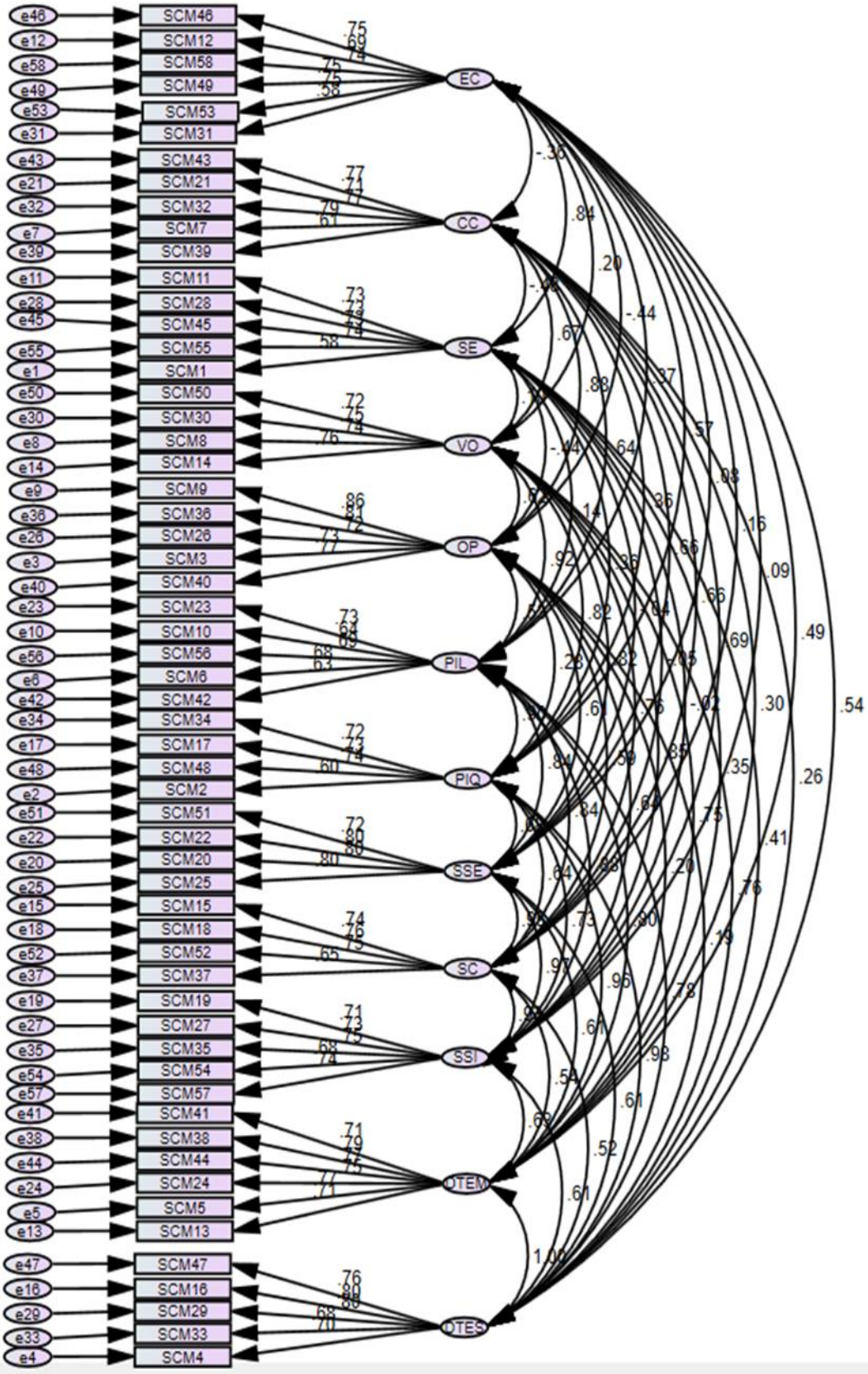


**Figure 1.** Initial measurement model (CFA) of the Sports Commitment Questionnaire-2.

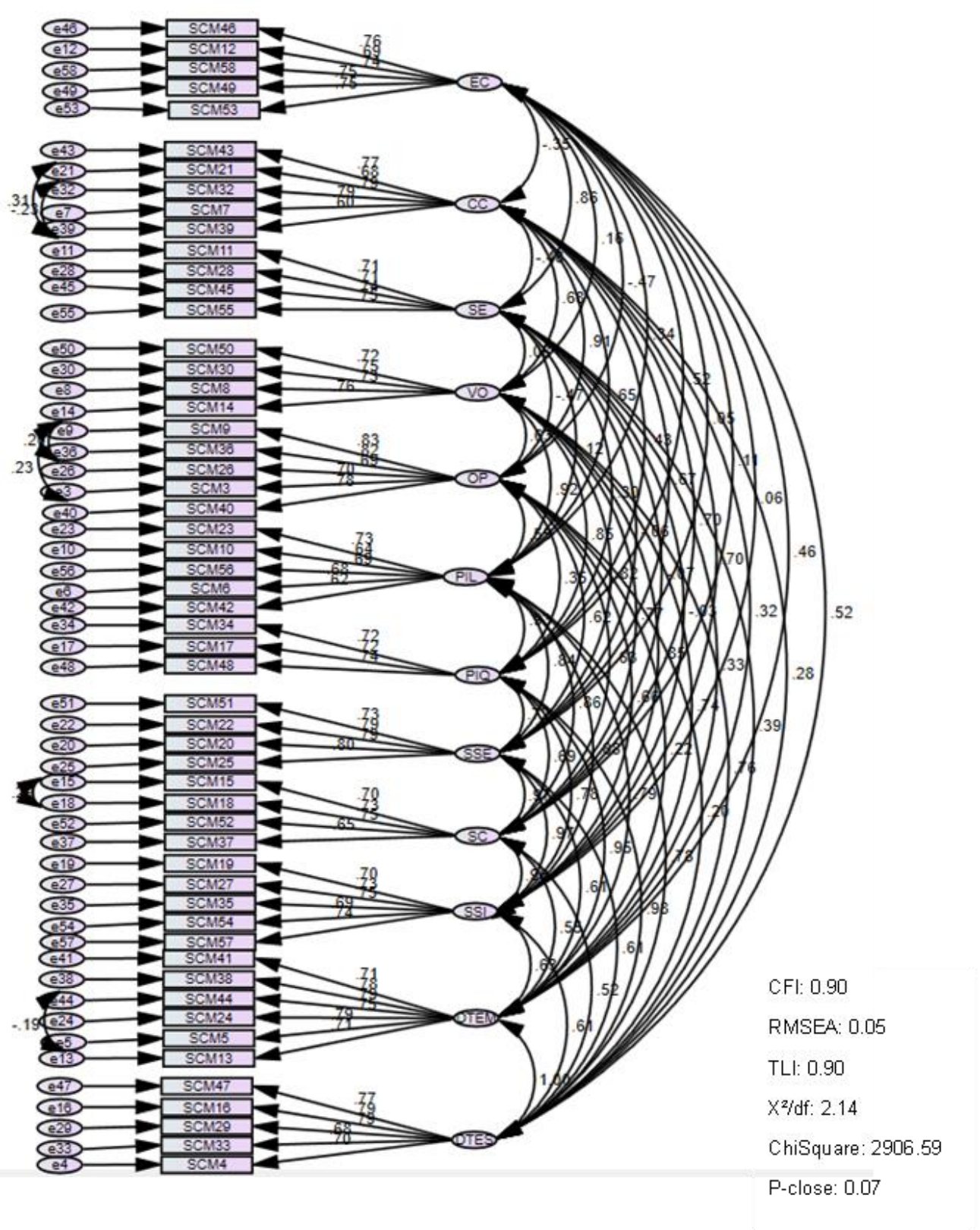


**Figure 2.** CFA model of the Sports Commitment Questionnaire-2 after modification.

Assessing construct reliability is important in verifying the consistency and stability of the items within the latent construct. This study utilized CR to test the reliability. CR value above 0.60 indicates good realiability (25). The CR values ranged from 0.77 to 0.89 (see Table 2) indicating good internal consistency. While convergent validity refers to the extent to which items within a construct relate to and measure the same underlying construct. This study utilized AVE to examine the measure of convergent validity. The AVE obtained from this study ranges from 0.50 to 0.68 indicating that the items explain more than half of the variance in the belonging indicators (28).

**Table 1. HTMT ratio between the variables**

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Enthu. Commitment** | - | -0.34 | 0.77 | 0.21 | -0.43 | 0.36 | 0.54 | 0.10 | 0.14 | 0.09 | 0.49 | 0.54 |
| **Const. Commitment** | | - | -0.60 | 0.73 | 0.88 | 0.64 | 0.39 | 0.65 | 0.68 | 0.70 | 0.31 | 0.27 |
| **Sports Enjoyment** | | | - | 0.11 | -0.57 | 0.15 | 0.40 | -0.07 | -0.08 | -0.04 | -0.42 | -0.50 |
| **Valuable Opportunity** | | | | - | 0.67 | 0.86 | 0.88 | 0.87 | 0.81 | 0.71 | -0.80 | -0.82 |
| **Other Priority** | | | | | - | 0.54 | 0.31 | 0.62 | 0.61 | 0.65 | 0.22 | -0.20 |
| **Per. Invest Loss** | | | | | | - | 0.71 | 0.83 | 0.84 | 0.86 | 0.79 | -0.77 |
| **Per. Invest Quantity** | | | | | | | - | 0.68 | 0.63 | 0.74 | 0.74 | 0.81 |
| **Social Constraints** | | | | | | | | - | 0.85 | 0.86 | 0.60 | 0.61 |
| **Social Support Emo.** | | | | | | | | | - | 0.83 | 0.53 | 0.53 |
| **Social Support Info.** | | | | | | | | | | - | 0.63 | 0.73 |
| **DesireExcelMastery** | | | | | | | | | | | - | 0.61 |
| **DesireExcelSocial** | | | | | | | | | | | | - |

**Table 2. Composite reliability and Convergent Validity of the variables**

| Construct Reliability (CR, α) and Validity of SCQ-2 | | | | |
|---|---|---|---|---|
| **Variables** | **No of items** | **CR** | **A** | **AVE** |
| **EC** | 5 | 0.86 | 0.86 | 0.68 |
| **CC** | 5 | 0.85 | 0.85 | 0.53 |
| **SE** | 4 | 0.82 | 0.82 | 0.52 |
| **VO** | 4 | 0.83 | 0.83 | 0.55 |
| **OP** | 5 | 0.87 | 0.88 | 0.58 |
| **PIL** | 5 | 0.80 | 0.80 | 0.51 |
| **PIQ** | 3 | 0.77 | 0.76 | 0.52 |
| **SSE** | 4 | 0.86 | 0.86 | 0.61 |
| **SC** | 4 | 0.80 | 0.82 | 0.50 |
| **SSI** | 5 | 0.85 | 0.84 | 0.52 |
| **DTEM** | 6 | 0.89 | 0.89 | 0.57 |
| **DTES** | 5 | 0.86 | 0.86 | 0.56 |

## DISCUSSION

The present study evaluated the psychometric properties of the Sports Commitment Questionnaire-2 among Malaysian racquet sports athletes. The original version of SCQ-2 was developed by Scanlan and colleagues (2016) (4). Due to the limited study on sports commitment in Southeast Asian countries in general and Malaysia in particular, we, therefore, examined the validity and reliability of the SCQ-2 using CFA to reconfirm if the model of the 58 items fit the data well. The ML was used to estimate the model as the data is normally distributed. The initial model did not show a good fit for the current sample. Therefore, the removal of three items (Item 1, Item 2, and Item 31) and covarying a number of error terms within factors resulted in an adequate model fit.

The initial SCQ-2 (English version) consists of 58 items with 12 subscales Three items with factor loading lower than the suggested cutoff value (0.60) i.e., Item 1 (playing this sports is fun, which belongs to sports enjoyment), Item 2 (I have spent a lot of time in this sports, which falls

under personal investment-quantity) and Item 31 (I am willing to overcome any obstacle to keep playing this sports, which belong to enthusiastic commitment) were deleted. The final set of SCQ-2 versions based on Malaysian racquet sports athletes consists of 55 items. Although items were deleted, however, the number of subscales remained similar to SCQ-2 (English version).

In this study, CR was utilized to test the reliability of SCQ-2. The suggested cut-off value for CR is 0.60 and above (25). All the CR values were within the acceptable range of 0.77 to 0.89 (see Table 2) showing good internal consistency. The CR values for this study were in line with previous studies (which range from 0.62 to 0.92) (2-4). Cronbach alpha values are also shown in Table 3. The r values obtained using Raykov's method fall within acceptable Cronbach alpha values (ranges 0.76 to 0.89) for all the subscales. The discriminant validity of all the subscales conformed to the suggested cut-off value of less than 0.90 (25) which suggested that the subscales were distinct from each other and suitable to examine the commitment of athletes effectively. Lastly, the AVE value for all the variables is above 0.50 which indicates that corresponding items explain more than half of the variance of its variable (28). Hence convergent validity was duly established.

**Table 3. Sports Commitment Questionnaire-2**

| | **Choose the answer based on the scale below.** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **1** **Strongly disagree** | **2** **Somewhat disagree** | **3** **Neither agree nor disagree** | **4** **Somewhat agree** | **5** **Strongly agree** | | | | |
| **1** | Other things in my life make it difficult to play this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **2** | I try to dominate in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **3** | In this sport, I am constantly trying to improve my skills. | | | | | 1 | 2 | 3 | 4 | 5 |
| **4** | The mental effort I have put into this sport makes it difficult to stop playing. | | | | | 1 | 2 | 3 | 4 | 5 |
| **5** | Staying in this sport is more of a necessity than a desire. | | | | | 1 | 2 | 3 | 4 | 5 |
| **6** | There are future events in this sport that I would really miss experiencing if I no longer played. | | | | | 1 | 2 | 3 | 4 | 5 |
| **7** | I am being pulled away from this sport by other things in my life. | | | | | 1 | 2 | 3 | 4 | 5 |
| **8** | The physical effort I have put into this sport makes it difficult to stop playing. | | | | | 1 | 2 | 3 | 4 | 5 |
| **9** | I like playing this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **10** | I am dedicated to keep playing this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **11** | Once I attain a goal in this sport, I challenge myself to continue improving. | | | | | 1 | 2 | 3 | 4 | 5 |
| **12** | I would really miss the travel experiences I have if I no longer played this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **13** | People would be upset if I didn't keep playing this sport because they have invested so much. | | | | | 1 | 2 | 3 | 4 | 5 |
| **14** | In this sport, I strive for the perfect performance. | | | | | 1 | 2 | 3 | 4 | 5 |
| **15** | In this sport, I have put in a lot of training. | | | | | 1 | 2 | 3 | 4 | 5 |
| **16** | People would be disappointed if I didn't keep playing this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **17** | I have a mentor who provides guidance in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **18** | People who are important to me attend the majority of my competitions in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **19** | I feel trapped in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **20** | People who are important to me are there for me after I perform poorly in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **21** | The time I have spent in this sport makes it difficult to stop playing. | | | | | 1 | 2 | 3 | 4 | 5 |
| **22** | I constantly try to learn from my mistakes in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **23** | When things get tough in this sport, people who are important to me provide comfort. | | | | | 1 | 2 | 3 | 4 | 5 |
| **24** | It is almost impossible to play this sport because of other things in my life. | | | | | 1 | 2 | 3 | 4 | 5 |
| **25** | People who are important to me teach me the strategies of this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **26** | I love to play this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **27** | In this sport, I strive to be better than my opponents. | | | | | 1 | 2 | 3 | 4 | 5 |
| **28** | I would really miss the things I learn in this sport if I didn't play. | | | | | 1 | 2 | 3 | 4 | 5 |
| **29** | Although I think about quitting this sport, I feel must keep playing. | | | | | 1 | 2 | 3 | 4 | 5 |
| **30** | I push myself to win every time I compete in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **31** | I have put a great deal of mental effort into this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **32** | People who are important to me teach me about the mental side of this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **33** | There are other things in my life that limit my participation in this sport. | | | | | 1 | 2 | 3 | 4 | 5 |
| **34** | Because people who are important to me also play this sport, it is assumed that I will keep playing. | | | | | 1 | 2 | 3 | 4 | 5 |
| **35** | In this sport, I strive to improve every aspect of my performance. | | | | | 1 | 2 | 3 | 4 | 5 |
| **36** | I feel I am forced to keep playing this sport. | | | | | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **37** | Other things in my life compete with playing this sport. | 1 | 2 | 3 | 4 | 5 |
| **38** | I push myself to reach my full potential in this sport. | 1 | 2 | 3 | 4 | 5 |
| **39** | It is difficult to stop playing because of the personal discipline I have maintained in this sport. | 1 | 2 | 3 | 4 | 5 |
| **40** | I feel I have to keep playing this sport, even though I don't want to. | 1 | 2 | 3 | 4 | 5 |
| **41** | To improve in this sport, I push myself to achieve the goals that I have set. | 1 | 2 | 3 | 4 | 5 |
| **42** | Playing this game is very pleasurable. | 1 | 2 | 3 | 4 | 5 |
| **43** | I am determined to keep playing this sport. | 1 | 2 | 3 | 4 | 5 |
| **44** | In this sport, I challenge myself to be better than everyone else. | 1 | 2 | 3 | 4 | 5 |
| **45** | I have put a great deal of physical effort into this sport. | 1 | 2 | 3 | 4 | 5 |
| **46** | I am very attached to this sport. | 1 | 2 | 3 | 4 | 5 |
| **47** | I would really miss the competition in this sport if I no longer played. | 1 | 2 | 3 | 4 | 5 |
| **48** | When I compete in this sport, people who are important to me cheer me on. | 1 | 2 | 3 | 4 | 5 |
| **49** | People who are important to me expect me to keep playing this sport. | 1 | 2 | 3 | 4 | 5 |
| **50** | I will continue to play this sport for me as long as I can. | 1 | 2 | 3 | 4 | 5 |
| **51** | People give me trustworthy advice about this sport. | 1 | 2 | 3 | 4 | 5 |
| **52** | Playing this sport makes me happy. | 1 | 2 | 3 | 4 | 5 |
| **53** | It is difficult to stop playing because of the training I have put into this sport. | 1 | 2 | 3 | 4 | 5 |
| **54** | In this sport, people provide useful instruction to improve my performance. | 1 | 2 | 3 | 4 | 5 |
| **55** | I am willing to do almost anything to keep playing this sport. | 1 | 2 | 3 | 4 | 5 |

Items 9, 26, 42, and 52 = Sport Enjoyment; Items 6, 12, 28, and 47 = Valuable Opportunities; Items 1, 7, 24, 33, and 37 = Other priorities; Items 4, 8, 21, 39, and 53 = Personal Investments-Loss; Items 15, 31, and 45 = Personal Investments-Quantity; Items 13, 16, 34, and 49 = Social constraints; Items 18, 20, 23, and 48 = Social Support-Emotional; Items 17, 25, 30, 51, and 54 = Social Support-Informational; Items 3, 11, 22, 35, 38, and 41 = Desire to Excel-Mastery Achievement; Items 2, 14, 27, 30, and 44 = Desire to Excel-Social Achievement; Items 10, 43, 46, 50 and 55 = Enthusiastic Commitment; Items 5, 19, 29, 36, and 40 = Constrained Commitment.

There are several limitations in this study. The time allowed for approaching the participants was limited and restricted as all the athletes had their own training schedule, in different locations. Therefore, researchers had time constraints when approaching the participants. Another issue was, that some participants were completing the questionnaire hurriedly as they were expected to join in another training session or rushing home. Thus the time spent on answering the questionnaire might not be effective. Another limitation was the study could not be generalized to all the locations in Malaysia as some places did not have a centralized center for the state's players.

The recommendations for future studies should include a larger sample size by including all the states in Malaysia. Besides, future studies could consider conducting longitudinal studies to explore the sports commitment of athletes over an extended period of time. This approach provides valuable thoughts to researchers on how factors of sports commitment evolve throughout athletes' sports careers. Another suggestion is to extend the study to various sports, and further include various age groups and skill levels. The effort could bring assurance of the usefulness and stability of the questionnaire especially in Malaysia.

As the psychometric properties of SCQ-2 are established through this study, it is useful for sports psychologist to assess their athlete's commitment. This enables them to design specific training programs that could motivate athletes to pursue training programs. Besides, using SCQ-2 enables sports practitioners to monitor athletes' commitment regularly. The commitment among athletes could change from time to time which could indicate potential issues e.g., burnout or another psychological issue. Through careful investigation and monitoring, sports practitioners could adapt their sports programs to ensure that all the training programs remain interesting, relevant, and effective. Last but not least, SCQ-2 could be utilized in educational programs and intervention activities to improve athletes' mental skills and overall well-being.

## CONCLUSION

In conclusion, the purpose of this present study was to validate the Sports Commitment Questionnaire-2 among Malaysian racquet sports players. The finalized SCQ-2 version consists of 55 items. The final CFA model of SCQ-2 showed good fit validity and reliability. SCQ-2 is a reliable instrument to examine Malaysian racquet sports athletes' commitment to sports.

## APPLICABLE REMARKS

- This study confirmed the psychometric properties of SCQ-2 which consists of ten factors and two sport commitment dimensions. Through the validation of SCQ-2 in Malaysia, sports psychologists and practitioners can assess Malaysian athletes' commitment and the factors that drive them to participate in sports.
- This could help sports psychologists and practitioners to foster the identified factors by designing a proper and inviting environment for athletes to promote active involvement in sports of athletes.
- In addition, SCQ-2 is also able to provide useful information on the factors and level of sports commitment before and after a period of the intervention program.

## ACKNOWLEDGMENTS

This research was supported by the University of Malaya Research Grant (UMRG)(Research Grant No. GPF020G-2020). We would like to acknowledge all the sport centres in Malaysia such as states' badminton, tennis, ping pong and squash associations. We also like to express our gratitude to UM athletes who assisted in the data collection. Last but not least, many thanks to the coaches in allowing us to spare time with their athletes during the data collection process.

## AUTHORS' CONTRIBUTIONS

Study concept and design: Eng Wah Teo, Arthur Ling. Acquisition of data: Arthur Ling, Ngien Siong Chin, Lee Sze Kho, Kanagarajah Rarujanai. Analysis and interpretation of data: Eng Wah Teo, Arthur Ling. Drafting the manuscript: Remco Polman, Arthur Ling. Critical revision of the manuscript for important intellectual content: Eng Wah Teo, Ngien Siong Chin, Remco Polman. Statistical analysis: Arthur Ling, Lee Sze Kho. Administrative, technical, and material support: Kanagarajah Rarujanai, Lee Sze Kho, Arthur Ling. Study supervision: Eng Wah Teo, Ngien Siong Chin.

## CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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