

## An Analysis of Exercise Commitment Constructs in Male and Female using Factor Analysis

Adeel Ahmad\*

\*Research Scholar, Shri Venkateshwara University, Gajraula, Amroha (Uttar Pradesh)  
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### Abstract

**Background:** the aim of the research towards the analysis of exercise commitment constructs in male and female subjects.

**Methods:** The sample consisted of one hundred (100) subjects (47 male and 53 female) were randomly selected from different places of Uttar Pradesh. The age of the subjects was 18-35 years and a self made questionnaire was used. Exploratory factor analysis and confirmatory factor analysis was used.

**Results:** The results indicate that the total variance explained in case of enjoyment factor 4 items (60.119%) and 3 items (79.308%), for alternative 4 items (66.762%) and 3 items (80.315%), investment 3 items (76.626%), control 7 items (37.211%) and 3 items (72.038%) and finally for involvement 4 items (61.886%) and 3 items (75.365%). Selected constructs are reliable and valid as the Cronbach alpha was greater than .70 and no difference exists between male and female in relation to the items of enjoy, alternative involvement, personal investment, social control and involvement opportunity as the value of z-score was less than 1.96.

**Conclusions:** The research therefore indicates that constructs as suggested by Scalen is applicable for both male and female.

**Key words:** Commitment, EFA, CFA

### INTRODUCTIONS

Physical education is a widening profession that focuses on human movement. Its customary application has had the major objective of providing people with increasing control over their own performance capabilities. Within this process, the mind also gets disciplined to the requirement and aptitude of its body in turn can give alertness and expressions to the mind. Physical education seeks to achieve an optional functioning of all systems of the body in harmonic coverage with a discerning mind (Majumdar).

Plato was among the first to recommend the careful planning of the physical education of the youth. In his Protagoras of about 350 B.C. he said, "... Send them to the master of physical training so that their bodies may better minister to the virtuous mind, and that they may not be compelled through bodily weakness to play the coward in war or any other occasion". Socrates also emphasized the importance of physical development objectives in these words". No citizen has a right to be an amateur in the matter of physical training .... What a disgrace it is for a man to grow old without even seeing the beauty strength of which his body is capable of (Gardener)

The aim of physical education must be inexorably related to the qualities of the physically educated person. Thus, it is not only an essential ingredient of human biologic life, but also mental social, emotional and spiritual life. Physical education is interested in the process of human movement as well as in the product and consequently uses many patterns of activity. A new physical education concept has emerged in our societies. It is a body of knowledge which acknowledges that, "as we

learn to move, to we move to learn” that as we strive for human well being there is humanism in the strife(Celesta)

In the words of Sara M. Johnson, “one of the most desirable ways of teaching democracy to boys and girls at the elementary school level is through a planned program of physical education.....{Among other values} a social consciousness can be developed that will enable the child to accept his place in the group as leader or co-operating followers”.

Jarani J and et.al in their study showed that exercise- and games-based PE represents a useful strategy for improving health- and skill-related physical fitness in Albanian elementary school children. Physical exercise improves physical fitness of children and pupils may also benefit from sports with regard to cognitive competence. However, timetable and syllabus often give little scope so that alternatives such as combined lessons in English and sports may be suited to integrate the desire for exercise and leaning (Koch HJ and et al.)added that Childhood obesity is the result of a long lasting imbalance between energy intake and energy expenditure. A major contributing factor is physical inactivity which is closely linked to bone health, cardiovascular disease risk, fitness and psychological factors. The school seems to provide an excellent setting to enhance levels of physical activity (PA). Ericsson I, Karlsson MK pointed out Daily PE and adapted motor skills training during the compulsory school years is a feasible way to improve not only motor skills but also school performance and the proportion of pupils who qualify for upper secondary school. problems. Hofstetter MC, Mäder U, Wyss T. indicated that the change from a civilian daily routine to the physically more demanding military routine led to significant improvements in physical fitness. Thus, physical activity is important for the children to overcome different. In order to do a regular physical exercises one needs a certain degree of commitment to himself. Sport commitment represents a psychological state rather than the actual behaviour of staying in or leaving an activity (Scanlan et al., 1993a). Scanlan et.al., 1993a defined sports commitment as '*a psychological construct representing the desire and resolve to continue sport participation*'. The Sport Commitment Model, (Scanlan et. al., 1993a) in which sports commitment , sports enjoyment, involvement alternatives personal investment, social constraints and involvement opportunities constructs were mentoend. Therefore, in the present study effort was made to find out the commitment constructs in relation to regular exercise in male and female.

### **Objective of the Study**

To analyze the exercise commitment constructs in male and female subjects.

## **PROCEDURE AND METHODLOLY:**

### **Participants**

The sample consisted of one hundred (100) male and female subjects were randomly selected from different district of Uttar Pradesh. The age of the subjects was 14- 16years.

### **Measures**

The selection of a proper tool was of vital importance for this study since the aim is to find out the factor assisting in exercise commitment and to compare the exercise commitment between male and female. It was decided to use questionnaire as

the tool. With the help of the questionnaire the investigator may tried to get the reflection of towards exercise commitment. Questions were adapted in below mentioned sections from the model given by The Sport Commitment Model, (Scanlan et. al., 1993a) in which sports commitment , sports enjoyment, involvement alternatives personal investment, social constraints and involvement opportunities were developed . Defined sports enjoyment as 'a positive affective response to the sport experience that reflects generalised feelings such as pleasure, liking, and fun', Involvement Alternatives is defined as 'the attractiveness of the most preferred alternative(s) to continued participation in the current endeavour, Defined as 'the attractiveness of the most preferred alternative(s) to continued participation in the current endeavour as the 'personal resources that are put into the activity which cannot be recovered if participation is discontinued, Social Constraints as social expectations or norms which create feelings of obligation to remain in the activity, Involvement Opportunities as 'valued opportunities that are present only through continued involvement'.The word sport was replaced with exercise and factors were named Exercise enjoyment(Enjoy) , involvement alternatives(Altern) personal investment(Invest), social constraints(SocCon) and involvement opportunities(InvOpps).Scholar selected 22 worded questions and response was sought in five point likert scale from strongly disagree to strongly agree. The items were written as Enjoy\_1:I enjoy doing exercise this season?, Enjoy\_2:I am happy in doing exercise this season?, Enjoy\_3:I have fun in doing exercise this season?, Enjoy\_4:I like doing exercise this season?, Altern\_1:Exercise is very interesting to me ?, Altern\_2:I think there is fun in doing exercise?, Altern\_3:I like very much in doing exercise?, Altern\_4:I find difficulty to choose exercise over other activity ?, Invest\_1:I put enough time to do exercise?, Invest\_2:I put enough effort to do exercise?, Invest\_3:I put enough money to purchase exercise equipments?, SocCon\_1:I feel I have to do exercise so that i can be within my friends, SocCon\_2:I feel I have to exercise to please my friends, SocCon\_3:I feel I have to do exercise because of my parents have done so much, SocCon\_4:I feel I have to do exercise to please my mom, SocCon\_5:I feel I have to do exercise please my dad, SocCon\_6:I feel I have to have to do exercise to please my head coach, SocCon\_7:I feel I have to do exercise so that people won't think I am unfit, InvOpps\_1:Would you be a fit if you left exercise?, InvOpps\_2:Would you miss your exercise trainer?, InvOpps\_3:Would you miss the good times you have had exercising if you left exercise? and InvOpps\_4:Would you miss your friends if you left the exercising?.

### **Data analysis**

The research aims to find out the factor assisting in exercise commitment and to compare the exercise commitment between male and female. Hence the five factors which can influence exercise commitment have been studied. The statistical tools such as SPSS and AMOSS (Trail version) have been used. The reliability and validity of the questionnaire has been tested through SPSS. The study has been done by using factors analysis using Principal component analysis and Confirmatory Factor Analysis (CFA). Exploratory Factor Analysis was used to *explore* the factor structure (how the variables relate and group based on inter-variable correlations); Further, Confirmatory factor analysis (CFA) was applied to evaluate adequacy of the measurement items that connect to corresponding latent variables simultaneously.

## RESULTS AND DISCUSSIONS

In the research study the efforts was done to analyze the factors which contributed most to the exercise commitment. The five possible factors are included in the questionnaire. The factor analysis was applied on the response in order to indentify the latent factors which influence the exercise commitment.

<b>Table1: KMO and Bartlett's Test</b>	Enjoy	Altern	Invest	Social	Inv Opps
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.482	.749	.701	.498	.746
Bartlett's Approx. Test of Chi-Square Sphericity	202.358	181.103	130.986	211.225	134.463
df	6	6	3	21	6
Sig.	.000	.000	.000	.000	.000

The Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy statistics for Exercise enjoyment (.482), involvement alternative (.749), personal investment (.701), social constraint (.498) and involvement opportunity(.746) indicates that the sample is adequate and the p value Bartlett's Test of Sphericity statistics (.000) indicates that the correlation matrix of the variables considered in the study is not an identity matrix. This indicates that the factor analysis can be done on the data. Table1

**Table 2: Communalities**

St.No.	Extraction				
	Enjoy	Alternative	Involvement	Control	Involvement
1	.044	.811	.829	.298	.774
2	.817	.361	.777	.010	.694
3	.804	.715	.692	.402	.693
4	.739	.784	Item 1,2,3,	.507	.315
5	Item 2,3 and 4	Item 1, 3, 4,		.043	Item 1,2 and 3
6				.584	
7				.761	
			Item 4, 6 and 7		

### Ext.: Extraction, Extraction Method: Principal Component Analysis

The results indicates that the communalities of statement were significant in exercise commitment except in case of St, 1 (Enjoyment), St.2(Alternative), St. 1, 2, 3, 5 (control) and St. 4 (Involvement opportunity) as the value of extraction were less than 0.5. Thus, Item 2,3 and 4(Enjoyment), Item 1, 3, 4 (alternative), Item 1,2,3, (involvement), Item 4, 6 and 7 (control) and Item 1,2 and 3 (Involvement opportunity) were selected and reanalyzed.

**Table3:Total Variance Explained**

Factor	No of	Extraction Sums of Squared
	Initial Eigenvalues	Loadings

	Items	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Enjoy	4	2.405	60.119	60.119	2.405	60.119	60.119
	3	2.379	79.308	79.308	2.379	<b>79.308</b>	79.308
Alternative	4	2.670	66.762	66.762	2.670	66.762	66.762
	3	2.409	80.315	80.315	2.409	<b>80.315</b>	80.315
Investment	3	2.299	76.626	76.626	2.299	76.626	76.626
	3	2.299	76.626	76.626	2.299	<b>76.626</b>	76.626
Control	7	2.605	37.211	37.211	2.605	37.211	37.211
	3	2.161	72.038	72.038	2.161	<b>72.038</b>	72.038
Involvement	4	2.475	61.886	61.886	2.475	61.886	61.886
	3	2.261	75.365	75.365	2.261	<b>75.365</b>	75.365

Extraction Method: Principal Component Analysis

The results indicate that the total variance explained in case of enjoyment factor 4 items (60.119%) and 3 items (79.308%), for alternative 4 items (66.762%) and 3 items (80.315%), investment 3 items (76.626%) , control 7 items (37.211%) and 3 items (72.038%) and finally for involvement 4 items (61.886%) and 3 items (75.365%).

### Confirmatory Factor Analysis (CFA)

In this research study, CFA model was run through (AMOS trails version ) software. CFA allows the researcher to test the hypothesis that a relationship between the observed variable and the underlying latent construct exists.

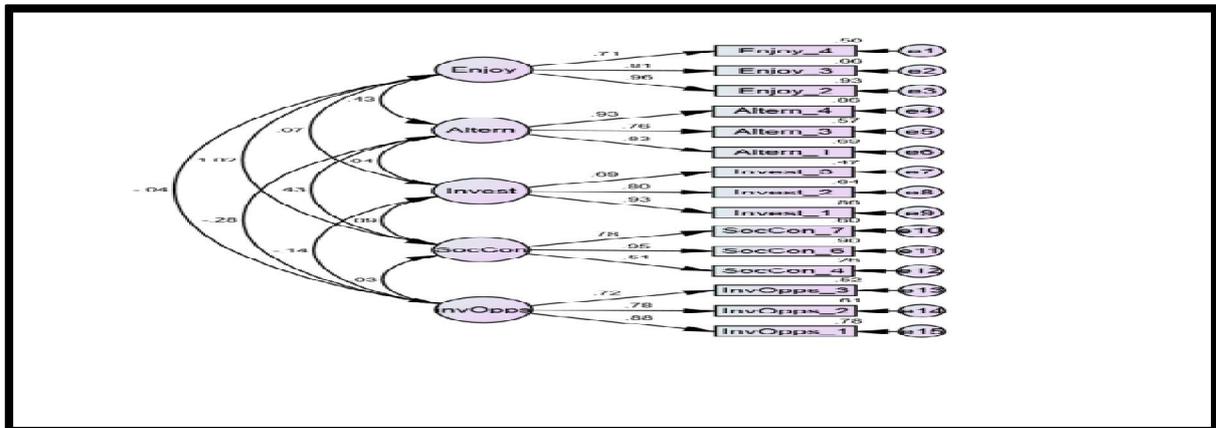


Figure1: CFA for the factors contributed to exercise commitment

Table4: Convergent and Discriminatory validity measures of various constructs

	CR	AVE	MSV	ASV	Cronbach Alpha
SocCon	0.803	0.590	.016	0.310	.793
Enjoy	0.872	0.698	.181	0.309	.865
Altern	0.879	0.709	0.185	0.113	.874
Invest	0.851	0.658	0.019	0.008	.842

The table 4 represent the convergent and discriminant validity measures of various constructs taken together in CFA. As shown in the results the composite reliability of each construct is more than 0.7 as well as greater than average variance extracted. This ensures the existence of convergent validity in the instrument. In addition to this average variance extracted of each construct is greater than MSV and ASV statistics which ensures the existence of discriminatory validity of the instrument. The high value of cronbach alpha, which indicates the correlation among all items of construct, indicates the high level of reliability of the construct.

**Table5: Invariance test of Enjoyment for Comparison between Male and Female Subjects**

			Male		Female		
			Estimate	P	Estimate	P	z-score
Enjoy_3	<---	Enjoy	0.845	0.000	1.038	0.000	0.817
Enjoy_2	<---	Enjoy	1.336	0.000	1.436	0.000	0.294

Notes: \*\*\* p-value < 0.01; \*\* p-value < 0.05; \* p-value < 0.10

The above table reveals that no difference exists between male and female in relation to the items of enjoy as the value of z-score was less than 1.96.

**Table6: Invariance Test of Involvement Alternative for Comparison between Male and Female Subjects**

			Male		Female		
			Estimate	P	Estimate	P	z-score
Altern_3	<---	Altern	0.738	0.000	0.984	0.000	1.235
Altern_1	<---	Altern	0.799	0.000	0.849	0.000	0.272

Notes: \*\*\* p-value < 0.01; \*\* p-value < 0.05; \* p-value < 0.10

The above table reveals that no difference exists between male and female in relation to the items of involvement alternative as the value of z-score was less than 1.96.

**Table7: Invariance Test of Personal Investment for Comparison between Male and Female Subjects**

			Male		Female		
			Estimate	P	Estimate	P	z-score
Invest_2	<---	Invest	0.972	0.000	0.969	0.000	-0.011
Invest_1	<---	Invest	1.294	0.000	1.447	0.000	0.387

Notes: \*\*\* p-value < 0.01; \*\* p-value < 0.05; \* p-value < 0.10

The above table reveals that no difference exists between male and female in relation to the items of personal investment as the value of z-score was less than 1.96.

**Table8: Invariance Test of Involvement Opportunity for Comparison between Male and Female Subjects**

			Male		Female		
			Estimate	P	Estimate	P	z-score
InvOpps_2	<---	invOpps	0.912	0.000	0.970	0.000	0.216
InvOpps_1	<---	invOpps	1.339	0.000	1.295	0.000	-0.118

Notes: \*\*\* p-value < 0.01; \*\* p-value < 0.05; \* p-value < 0.10

The above table reveals that no difference exists between male and female in relation to the items of involvement opportunity as the value of z-score was less than 1.96.

**Table9: Invariance test of Social Constraint for Comparison between Male and Female Subjects**

			Male		Female		
			Estimate	P	Estimate	P	z-score
SocCon_6	<---	SocCon	0.821	0.003	1.160	0.000	1.042
SocCon_4	<---	SocCon	0.385	0.011	0.479	0.000	0.519

Notes: \*\*\* p-value < 0.01; \*\* p-value < 0.05; \* p-value < 0.10

The above table reveals that no difference exists between male and female in relation to the items of Social constraint as the value of z-score was less than 1.96.

### **FINDINGS OF THE STUDY**

According to Lavon Williams , A commitment to physical activity is necessary for personal health, and is a primary goal of physical activity practitioners. Wininger SR , Pargman D. reported that participating in regular physical activity results in many positive physical and psychological effects. Enjoyment of exercise seems to be a mediator of exercise level. Furthermore, health care-based interventions seem to be able to affect enjoyment of exercise. Further, Hagberg LA mentioned that enjoyment of exercise may be important for the long-term effectiveness, of health care-based interventions. Thus in the present study the total variance explained in case of enjoyment factor 4 items (60.119%) and 3 items (79.308%), for alternative 4 items (66.762%) and 3 items (80.315%), investment 3 items (76.626%) , control 7 items (37.211%) and 3 items (72.038%) and finally for involvement 4 items (61.886%) and 3 items (75.365%). The composite reliability of each construct was more than 0.7 as well as greater than average variance extracted. This ensures the existence of convergent validity in the instrument. In addition to this average variance extracted of each construct is greater than MSV and ASV statistics which ensures the existence of discriminatory validity of the instrument. The high value of cronbach alpha, which indicates the correlation among all items of construct, indicates the high level of reliability of the construct. This shows that the constructs are reliable and valid. Further, no difference exists between male and female in relation to the items of enjoy, alternative involvement, personal investment, social control and involvement opportunity as the value of z-score was less than 1.96. This shows that the instrument can be used for both male and female.

### **CONCLUSIONS**

The research therefore indicates that constructs as suggested by Scanlan, T. K.,(1993 a) is applicable for both male and female for studying exercise commitment.

### **FUTURE SCOPE OF THE STUDY**

The present study may help the researcher to use the instrument. The presents may help to develop and to study the items/ constructs in more details and with more sample size. It also provide the base for the other researchers to extent the study to the other parts of the country.

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