

## The Effect of Competence on Training engagement among Shooting Athletes

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### Abstract

This study was to examine the effect of competence on training engagement among shooting athletes. For this purpose, the data was collected from 102 participants with using Intrinsic Motivation Inventory (IMI) and training engagement scale (TES). The data was analyzed by MANOVA, correlation analysis, and multidimensional analysis. The results were as follows: Firstly, male athletes showed higher degree of cognitive and behavioral engagement than female athletes. In addition, the verification on differences in training engagement by career showed that athletes with 5 to 10 years of experience had higher degree of behavioral engagement than others. Finally, the analysis on verifying the relationship between training engagement and competence illustrated that competence was influenced by cognitive engagement. Therefore, cognitive engagement of athletes needs to be improved in order to increase the competence for shooting athletes.

Keywords: competence, training engagement, shooting athletes

### Introduction

In sports, there are many factors predicting success and failure in competitions. In particular, these factors are diverse from personal/ inner inclination to external factors such as circumstance and environment. Recently, research interest on engagement is growing among these attributes on tasks and goals. According to Sherif and Cantril (1947), engagement refers to personal importance or degree of interest induced by stimulus under certain circumstances. It helps experiencing joy and interest during performance and induces immersion and participation with making possible to use performance strategy (Lee, 2013).

Furthermore, Antil (1984) considered engagement as perceived personal importance and the degree of engagement is determined by personal interpretation of

self. Engagement is decided by the personal interpretation of the relativity of variables in product, circumstance, and communication (Ryu, 2002).

In the field of leisure, it is reported that engagement effects psychological loyalty and constant behavior (Havitz, 1988). If engagement is high, loyalty for leisure activity rises with raising the chances of continuous long-term leisure activity. In particular, the strengthening of motivational behavior for task by engagement in this process is explained by importance of task, perceived pleasure, centrality to lifestyle, self-expression, and cognitive elements of risk (Park, 1999; Lee, 2000).

Moreover, research on engagement in learning situations showed that the learner highly perceived the instructor's level of support for autonomy, highly perceived the task value given in class, and that students who showed confidence of the class actively participate in class (Chung, 2012). Additionally, perceived competence of learners has direct effect on learning

participation (Kim & Doe, 2009). Overall, it is important to consider students' activeness in carrying out tasks with considering the number of participants and attendance (which is quantitative aspects) in defining learning engagement. In other words, the relationship between students' activity and goals of the lesson, and whether or not the result is from the voluntary behavior of student participation should be taken into questions (Lee, 2014).

In present, conceptual research on engagement in sports setting has been conducted based on academic engagement theory consisting of 4 factors. These 4 factors are behavioral engagement, emotional engagement, perceptual engagement, and dominant engagement to verify the relationship among personal motive, emotion, and personality characteristics in a sports training situation (Moon, Choi, & Seong, 2014). Moreover, Moon (2015) defined TES as cognitive, emotional, behavioral, and dominant standard while carrying out training activities in sports situation.

In such context, the definition of training engagement in this research is a degree of activeness and engagement in terms of behavior, emotion, perception, and dominance when starting and participating in training (Lee, 2014; Moon, 2015).

The relationship between competence and engagement in this research focuses on the effect of competence including goal orientation and self concepts (which is a motivational variable used to explain the effort and task achievement behavior in learning situation). In particular, Ahn (2014) verified the relationship between the two variables by structural analysis of positive thinking and competence/engagement in middle school students. Additionally, a study on the relationship of parental relationship engagement and competence was announced (Seo, 2015). Furthermore, Byun (1999) verified the relationship of motivational behavior and competence by investigating relationship of self and task engagement and perceived competence in a competitive sports situation. Therefore, in this research the relationship between competence variable and training were

examined to demonstrate that engagement plays a key role in enhancing overall motivational behavior such as effort and fulfillment in training situation. Furthermore, the research was to verify the influence of athletes' perceived competence on training engagement for enhancing performance in competitions.

## Method

### Participants

Participants were 102 currently elite shooting athletes and responded on the questionnaires. We used the stratified sampling method to collect the athletes according to their career. Ages of participants were ranged from 20 to 22. Participants consisted of 57 male and 45 female athletes. Also, 52 athletes had the experience of 5 to 10 years, 28 athletes had 10 to 15 years, and 22 athletes had more than 15 years among participants.

### Measures

#### Competence.

Competence factor (5 questions) of IMI (Intrinsic Motivation Inventory) was used which was developed by Ryan (1982) and revised properly for measuring Korean wrestling athletes by Seong (1995). The IMI questionnaire has been frequently used in sports settings. The results of reliability analysis indicated the .8 reliability coefficient (Cronbach's  $\alpha$ : C.A).

#### Training engagement.

The training engagement scale (TES) used in this research was developed in general psychology field by Lee & Chang (2010). It was revised by Moon et al. (2014) for using sports training setting. This TES was developed by first making preliminary questions by

focus interviews with high-school and university coaches. In addition, the construct validity and standard validity were verified with shooting athletes. 2 sports psychologists and researchers verified content validity for usage of this research. 26 questions were revised with consisting of cognitive training engagement (6 questions), emotional training engagement (7 questions), behavioral training engagement (8 questions), and dominant training engagement (5 questions). The questionnaire uses 5-point likert scale from 'very

negative' (1 point) to 'very positive' (5 point). The reliability of training engagement was checked and it showed .8 reliability coefficient (cronbach's  $\alpha$ : C.A). As the result of confirmatory factor analysis, the construct model of 3 factors 15 items illustrated appropriate fit indices ( $\chi^2$ : 46.434, df: 23, Q:2.107, RMR:.051, CFI:.923, GFI:.909, NFI:.864). These value of fit indices were acceptable (Bae, 2009) . The results were showed in table 1.

**Table 1.** Confirmatory factor analysis of training engagement scale(TES).

Factors	Q	RMR	CFI	GFI	NFI
Cognitive Engagement					
Dominant Engagement	2.107	.051	.923	.909	.864
Behavioral Engagement					

\*, \*\* and \*\*\* indicate that type I error is less than .05, .01, and .001 respectively (p < .05, p < .01, and p < .001).

**Table 2.** Basic statistical results of training engagement by gender

	Gender	M	SD	F
<u>Training engagement</u>				
Cognitive Engagement	Male	4.16	.61	
	Female	3.92	.55	4.306*
	Total	4.05	.60	
Dominant Engagement	Male	3.44	.79	
	Female	3.58	.63	.932
	Total	3.50	.72	
Behavioral Engagement	Male	4.00	.61	
	Female	3.68	.52	7.770**
	Total	3.86	.59	

Note. Wilks Lamda: .897\*\*.

\*, \*\* and \*\*\* indicate that type I error is less than .05, .01, and .001 respectively (p < .05, p < .01, and p < .001).

## Data Analysis

The data analysis process of this research was as follows. Firstly, Cronbach's Alpha coefficient was examined reliability analysis (inner conformity) on detected sub-factors and sub-questions. Secondly, confirmatory factor analysis was performed on detected sub factor structure. Chi-square ( $\chi^2$ ) test and other fit

indices (e.g., GFI, CFI, RMR, and NFI) were used to test the model fit of the CFA. Thirdly, MANOVA was conducted to verify the difference of variables according to athletes' backgrounds, such as gender and career. Finally, correlation analysis and multiple regression analysis were performed to verify multidimensional relationship between variables.

**Table 3.** Basic statistical results of training engagement by career

	Career	M	SD	F
Training engagement				
	5-10 year	4.13	.62	
Cognitive Engagement	10-15 year	3.97	.61	.956
	more than 15 year	3.97	.46	
	total	4.05	.60	
	5-10 year	3.62	.65	
Dominant Engagement	10-15 year	3.46	.80	2.080
	more than 15 year	3.26	.75	
	total	3.50	.72	
	5-10 year	4.05	.60	
Behavioral Engagement	10-15 year	3.67	.61	6.290**
	more than 15 year	3.63	.35	
	total	3.86	.59	

Note. Wilks Lamda: .868\*.

\*, \*\* and \*\*\* indicate that type I error is less than .05, .01, and .001 respectively ( $p < .05$ ,  $p < .01$ , and  $p < .001$ ).

**Table 4.** Results of correlation analysis of competence and training engagement

Variable	Cognitive Engagement	Dominant Engagement	Behavioral Engagement	Competence
Cognitive Engagement	1	.077	.532**	.401**
Dominant Engagement	.077	1	.242*	-.045
Behavioral Engagement	.532**	.242*	1	.186
Competence	.401**	-.045	.186	1

Note. The coefficients are standardized values. Each coefficient is the correlation between training engagement and competence. \* and \*\* indicate that the type I error is less than .05 and .01, respectively ( $p < .05$  and  $p < .01$ ).

**Table 5.** Multiple regression analysis results on competence and training

Standard Variable	Predict variable	R2c	R2	$\beta$	t	F
Competence	Cognitive Engagement	.161	.161	.401	4.838	19.209***

Note. \* and \*\* indicate that the type I error is less than .05 and .01, respectively ( $p < .05$  and  $p < .01$ ).

## Results

### Training engagement by gender and career.

MANOVA was conducted to verify the differences in training engagement according to performance career of

shooting athletes. First, the analysis of training engagement by gender along with basic statistics is showed at table 2.

As shown in table 2, there were meaningful differences in cognitive engagement and behavioral engagement by gender. In particular, male athletes show

higher level of engagement than female athletes (in average value). In addition, the same method was used to analyze training engagement differences by sports career.

As suggested in table 3, there were meaningful differences in behavioral engagement by sports career. In particular, groups with 5 to 10 years of experience showed highest level of behavioral engagement (in average value).

### Relationship between perceived competence and training engagement

In order to examine the relationship between competence and training engagement, correlation analysis and multiple regression analysis were conducted. First, the relationship analysis results were illustrated in table 4 and table 5.

As it was showed in table 4, competence and cognitive engagement showed highest level of relationship. However, both behavioral and dominant engagement were irrelevant with competence. In addition, multiple regression analysis was conducted to check relevance. This value was shown in table 4.

As it illustrated in table 5, competence of shooting athletes was influenced approximately 16.1% by perceived engagement. This result supports the correlation analysis results. Consequently, the higher cognitive engagement degree during training, the higher degree of competence perception.

## Discussion

Training engagement illustrated similar traits with learning engagement and actual engagement level has been found to show relevance of competence according to previous researches. In this perspective, this study was to examine the relationship between training engagement and competence.

Firstly, the characteristics of training engagement according to gender and career were examined. Training

engagement was different according to gender. It means that there is difference in male athlete and female athletes' engagement during training. According to analysis results, male athletes showed higher degree of cognitive engagement and behavioral engagement. These results were similar with Moon (2015)'s research which concluded male athletes' engagement degree was higher but the engagement variables were different. In other words, there was difference in cognitive-behavioral engagement level according to gender, but Moon (2015)'s research revealed differences in dominant-emotional engagement with showing different tendency. In consequence, the results of this research can be attributed to the different types of sports.

Secondly, the verification on differences in training engagement by sports experience showed that athletes with 5 to 10 years of experience had the highest level of behavioral engagement. According to Ryu (2003), sports club members with professional experience illustrated different degree of sports engagement according to career experience. In particular, this result explains the fact that sports career is closely related with the level of sports engagement degree. Furthermore, athletes with 5 to 10 years of experience showed more active participation behavior during training situations and high engagement behavior such as choosing difficulty level and asking questions.

Finally, the analysis on verifying the relationship between training engagement and competence showed that competence has high reliance to cognitive engagement. This result is similar to Lee (2000)'s research on the verification of relevance between competence and engagement. In addition, this result is similar to Ahn (2014)'s study on competence and learning engagement. Some parts of Seo (2015)'s research on the relationship between engagement degree and competence of peer relationship also supports the conclusions of this research. Based on this finding, improving the level of cognitive engagement is crucial to enhance competence of shooting athletes.

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